

A REVISION OF THE GENUS COLLETES IN AMERICA
NORTH OF MEXICO (HYMENOPTERA, COLLETIDAE)

Vol. II

William P. Stephen

GROUP IX - hyalinus

Colletes hyalinus Provancher

Timberlake (1951) places spurcus Viereck in synonymy with hyalinus hyalinus. This synonymy and also that of fraseriae Swenk with C. hyalinus (sensu lato) are undoubtedly correct, but I question the synonymy of these two species with C. hyalinus (sensu stricto). Spurcus and fraseriae are both representatives of the montane population of this species and are the only mountain representatives known. While there are insufficient morphological characters to give spurcus subspecific rank in the present paper, it may eventually prove to rate this designation.

This variable species described first by Provancher from Quebec is found throughout northern America and along the western edge of the Great Plains where it occurs in the mountains. Two subspecies extend through the mountains to the coastal regions of Oregon and California.

C. hyalinus closely resembles C. lutzii Timberlake but has much less pile, particularly on the thorax and abdominal terga.

MALE: length 8 mm., wing length 5.75 mm.

Pile of face long, ragged, and pale grey, particularly over clypeus and supra-clypeal areas; vertex with pile tawny to tinged with ochreous; upper genal areas with pile pale grey, becoming much longer and whiter below; mesoscutum and scutellum with abundant, long, erect, pale grey pile,

occasionally a few darker hairs intermixed; mesepisterna with pile long, fine, pale grey above to white below; propodeum with weak fringes of long, white pile at upper latero-posterior margins, lateral and posterior faces with sparse, erect, pale grey pile; pile of legs very sparse, long, and white; first metasomal tergum with apical fascia weak, narrow, and white, lateral fringes not complete to apical fascia, discal area with abundant, long, fine, pale grey hairs; metasomal terga two to five with fasciae broader, weak, and white; metasomal sterna two to five with narrow fringes of pale grey pile on apical margin, fringes broadened medially.

Antennae long, reddish brown, flagellar segments one and one-quarter times as long as broad; malar space three-quarters as long as broad; clypeus weakly convex, rather densely and finely punctate over the basal two-thirds, punctures becoming sparser and more striate apically; vertex dull, densely punctate. Prothoracic spines long and sharp, almost twice as long as width across base; mesoscutum densely punctate over anterior one-third and lateral margins, impunctate area small; scutellum erratically punctate over posterior three-quarters, punctures one to two puncture widths apart, becoming much closer and finer posteriorly; mesepisterna rather shallowly punctate, punctures one puncture width apart above, becoming sparser below; propodeum deeply pitted with quadrate pits, lateral and posterior faces dull and weakly rugose. First metasomal tergum

variably punctate with shiny interspaces; metasomal sterna shiny, sparsely folliculated.

FEMALE: length 9 mm., wing length 7 mm.

Pile of face pale grey, concentrated principally about antennal bases; vertex with a few sparse hairs tinged with yellow; upper genal areas with pile tinged with yellow, becoming longer, finer, and whiter below; mesoscutum with pile long, fine, and light ochreous, concentrated about anterior one-third and lateral margins; scutellum with pile pale grey to light ochreous, clumped along the lateral and posterior margins; mesepisterna with pile long, fine, and white to pale grey; propodeum with long fringes of pale grey to light ochreous pile along upper latero-posterior margins, posterior face with abundant, erect, short, pale grey pile; pile of legs short and sparse on anterior two pair, posterior legs with pile long, light ochreous, and plumose.

Antennae reddish brown, flagellar segments three-quarters as long as broad; malar space three-eighths as long as broad; clypeus weakly convex, finely punctate along lateral margins and weakly, rugosely punctate over basal one-quarter and along median line, latero-apical margins sparsely punctate but dull; vertex densely punctate with shiny interspaces; fascial foveae narrow and depressed sharply dorsally, terminating at upper end of compound eye. Prothoracic spines long and sharp, approximately twice as

long as width across base; mesoscutum densely punctate over anterior one-third and lateral margins, impunctate area small; scutellum coarsely and densely punctate over posterior seven-eighths of surface, punctures contiguous except at anterior part of mid line, where they tend to be two puncture widths apart; mesepisterna densely punctate with shallow punctures, punctures almost contiguous above to one puncture width apart below, interspaces shiny; propodeum deeply, quadrately pitted, lateral and posterior faces dull and roughened; wings weakly covered with light fulvous pubescence; legs deep brown to black; posterior basitarsi three and three-quarter times as long as broad. Metasomal terga shiny; metasomal sterna dull, finely folliculated.

Colletes hyalinus hyalinus Provancher

hyalinus PROVANCHER, 1888, Addit. Faun. Canada Hymen., vol. 2, p. 303; GIBSON and CRIDDLE, 1919, Rept. Ent. Soc. Ontario for 1919, p. 21; GIBSON and CRIDDLE, 1920, Rept. Ent. Soc. Ontario, vol. 36, p. 132; TIMBERLAKE, 1951, Wasmann J. Biol. vol. 9, p. 210.

cauponarius COCKERELL, 1929, Ann. Mag. Nat. Hist., ser. 10, vol. 4, p. 297; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 390.

fraserae SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 41 (new synonymy).

nitidicaudus COCKERELL, 1929, Ann. Mag. Nat. Hist.,

ser. 10, vol. 4, p. 299; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 390.

spurcus VIARECK, 1903, Trans. Amer. Ent. Soc., vol. 29, p. 58; COCKERELL, 1905, Psyche, vol. 12, p. 87; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 291; GRESSON, 1928, Mem. Amer. Ent. Soc., vol. 5, p. 64; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 390; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 210.

This subspecies is found throughout the northern part of America from the eastern seaboard to the Rocky Mountains. For the present paper I shall consider both Colletes spurcus Viareck and Colletes fraserae to be synonyms of this subspecies.

The males differ from the above description in having the pile of the mesoscutum and scutellum long, rather sparse, and tawny, very weakly tinged with light ochreous; tegulae light brownish hyaline; nervures light brown; first metasomal tergum sparsely but distinctly punctate, punctures two to four puncture widths apart; metasomal terga three to six with the discs having abundant, short, erect, deep fulvous to black pile.

The female has the pile of the face, mesoscutum, and scutellum sparse, tinged with ochreous, often completely removed from the facial regions; metasomal terga with fasciae absent, evident only as sparse patches of short, white pubescence, particularly laterally on terga three and four;

tegulae brownish hyaline; nervures light brown; first metasomal tergum very finely and sparsely punctate, the punctures two to five puncture widths apart and of variable size.

Distribution:

Throughout northern America. Peripheral localities at King's County, Nova Scotia; Hemmingford, Quebec; Calais, Maine; Wexford County, Michigan; Beltrami County, Minnesota; White Fox, Saskatchewan; Hot Springs, South Dakota; Whitehorse, Yukon; Lethbridge, Alberta; Ward, Leadville, Creede, Gilpin, Aspen, Pingee Park, and Tenn. Pass, all in Colorado; Beulah, New Mexico.

Flight Records:

This species has been recorded between June 24 and September 5, flying principally during the months of July and August.

Plant Records:

Achilles, Cirsium, Epilobium, Kalmia, Melilotus, Solidago, Sumac.

The holotype is located in the Quebec Public Museum, Quebec City, Canada.

Colletes hyalinus oregonensis Timberlake

hyalinus oregonensis TIMBERLAKE, 1951, Wasmann J. Biol.

vol. 9, p. 211.

This subspecies occupies the coastal regions of Oregon and northern California.

The male differs from hyalinus in having pile longer and whiter over entire body; malar space as long as broad; first metasomal tergum with punctures fine and separated by two to four puncture widths; seventh ventral plates with weak apical median emarginations. The female is as in hyalinus but has the pile longer and more pale grey on the thorax; metasomal terga with apical fasciae much more evident and rather broad on terga two to four; first metasomal tergum with long dense lateral fringes of pile; clypeus more densely punctate with weak striate punctures almost to apex; first metasomal tergum with punctures fine and sparse, tergum almost felleculated rather than punctured.

Distribution:

Paratypes: 50 miles south Waldport, Oregon, July 14, 1937; Newport, Oregon, September 7, 1929 (H. A. Scullen); Newport Oregon, June 8, 1925; Crescent City, California July 13, 1937; Mouth of Redwood Creek, Humboldt County, California, July 11, 1937; Orick, Humboldt County, California, July 5, 1931; all of this material unless otherwise noted was collected by E. C. Van Dyke.

Other material: Coos County, Oregon, July 3, 1926; North Bend, Oregon, June 24, 1934; Florence, Oregon,

June 29, 1941.

Two specimens, a male taken at Rolla, British Columbia and a female from Metaline Falls, Washington, appear to be intermediate between h. hyalinus and h. oregonensis, but resembling h. hyalinus more closely. If these two were representatives of an intermediate form between the two subspecies there is possibility of intergradation in the valleys of the northern mountainous regions.

The holotype is located in the collections of the Citrus Experiment Station, Riverside, California.

Colletes hyalinus gaudialis Cockerell

gaudialis, COCKERELL, 1905, Bull. So. Cal. Acad. Sci., vol. 4, p. 32; gaudialis COCKERELL, 1905, Bull. So. California Acad. Sci., vol. 4, p. 106 (correction of gaudialis); COCKERELL, 1905, Psyche, vol. 12, p. 86; COCKERELL, 1906, Bull. Amer. Mus. Nat. Hist., vol. 22, p. 425; BRAY, 1917, Pomona J. Ent. Zool., vol. 9, p. 99; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 392; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 212.

californica VIERECK (not Provancher), 1903, Proc. Acad. Sci. Philadelphia for 1902, p. 730.

arenicola COCKERELL, 1926, Ann. Mag. Nat. Hist., ser. 9, vol. 18, p. 626; COCKERELL, 1933, Ann. Ent. Soc. Amer., vol. 26, p. 43.

Although abundant evidence for the placement of gaudialis as a subspecies of hyalinus is not as yet available, I agree with Timberlake that the group is sufficiently similar to h. hyalinus to rank as a subspecies. This form is more densely and coarsely punctate than hyalinus in both sexes. Intergradation of characters with h. oregonensis along the northern California coast indicate that the latter is an intermediate form between these two races.

The male differs from hyalinus in having the pile of thorax and abdomen much longer and denser; malar space three quarters as long as broad; first metasomal tergum very closely and densely punctate, punctures no more than one puncture width apart. The female differs in having pile of face long, dense and pale grey about antennal bases and inner orbital margins; vertex, mesoscutum and scutellum with pile long, dense and pale grey, tinged with ochreous; metasomal terga with dense, broad apical fasciae of pure white pubescence; first metasomal tergum with dense, long lateral fringes extending to apical fasciae, discal area with abundant long, erect white pile; clypeus densely punctate, shiny with punctures striate extending almost to apex, even at median line; first metasomal tergum with punctures coarse, indistinct, approximately two puncture widths apart.

Distribution:

The species occurs along the California coast from San Diego north at least as far north as Marin County and

has been recorded inland at Hemet and Riverside in southern California as well as Woodlake and Lindsay in Tulare County, Mendota in Fresno County and Tracy in San Joaquin County.

Flight Records:

The species has been recorded between April 19th until September 24th and occurs during all of the summer months.

Plant Records:

Asclepias, Baccharis, Eriogonum, Outierrezia, Heliotropium, Hemizonia, Isocoma, Melilotus, Oenothera, Solidago.

The holotype is located in the collection of the California Academy of Sciences.

Colletes lutzi Timberlake

The species is very difficult to distinguish from C. hyalinus, especially in the southern areas of California. Generally the pubescence is denser, shorter and usually paler on the thorax and abdomen, the puncturation of the abdomen usually coarser on the first two metasomal terga. The mesepisterna have the punctures of the upper face sparser, non-rugose, and with shiny interspaces. (In hyalinus the upper parts of the mesepisterna tend to be striately punctate.)

The males of the species differ from hyalinus in

having a somewhat shorter malar space, being not nearly as long as wide, and in having the seventh ventral plates emarginate apically. The lateral hair bands of the seventh ventral plates are weakly developed and not broadly united to the median band basally, and the pile of this lateral band is very much shorter, tending to be more appressed, than in typical hyalinus.

The close resemblance of this species to hyalinus suggests the possibility that the two species may intergrade or hybridize at one point or another. However, I have seen no material which would substantiate this hypothesis.

Through the courtesy of P. H. Timberlake, who has lent his typical series of lutzi for study, I find that g. monticola intergrades fully with C. lutzi along the northern outskirts of the Great Basin. Timberlake suspected this in saying, "It is possible that on the eastern and northern outskirts of the Great Basin monticola may occur and there intergrade with lutzi." However, in spite of two specimens from Bend, Oregon, and Craters of the Moon, Idaho, he apparently did not feel that he had sufficient material to warrant making monticola a subspecies of lutzi.

The species occurs in the mountainous regions from Colorado about the northern edge of the Great Basin into Washington, thence along the mountains into southern California, and to my knowledge is not found below 4000 feet. There is a great deal of variation in the species throughout the range as well as in the individual populations,

thus making recognition of subspecies rather difficult. Little variation exists in the males from Colorado to California; however, a few males from Oregon reach the length of 8 mm. There is some variation in the puncturation of the first metasomal tergum, particularly in specimens from the mountains of California, but these regional differences are not constant and equal variation appears to occur in individual populations.

In the females, evidence of subspeciation is much more distinct, principally in the amount of appressed pubescence on the discs of metasomal terga two to five.

MALE: length 6 to 8 mm., wing length 4.75 to 5.5 mm.

Pile of face long and dense, particularly about antennal bases and over clypeus, clypeus completely concealed; pile of vertex and upper genal areas sparse, long, and all light, pile becoming longer and whiter below; mesoscutum with pile long, fine, and dense; scutellum with a lateral and posterior fringe of long, fine, white to dusky pile; mesepisterna with pile long, fine, and pale grey to pure white; propodeum with dense fringes of long, pale grey to whitish pile, particularly on latero-posterior margins, fringes most dense on dorsal surface; pile of legs sparse and white; first metasomal tergum with apical fascia dense and broad, lateral fringes of pile long and dense reaching to apical fascia, disc with abundant, long pile, not concealing surface; metasomal terga two to five with fasciae broad, dense, and complete to extreme lateral

margins; metasomal terga three to six with discs having abundant, long, erect, pale grey to light yellowish pile, a few darker, short hairs intermixed; metasomal sterna two to four with apical fasciae broad, dense, and pale grey to white, broadened medially.

Antennae long, dark brown to black, flagellar segments one and one-half times as long as broad; malar space three-quarters to seven-eighths as long as broad; clypeus long, convex, with a very weak longitudinal median sulcus, basal portion very finely and densely punctate, punctures almost contiguous, becoming more striate on apical and latero-apical margins; vertex dull, very deeply, coarsely, and densely punctate, punctures almost contiguous. Prothoracic spines small, very sharply pointed, fully as long as the width across the base; mesoscutum variably punctate, impunctate area large; mesepisterna with punctures approximately one-half puncture width apart, becoming sparser below and towards posterior margins, interspaces shiny; propodeum with basal area irregularly, not quadrately pitted, dull, with abundant, longitudinal rugae, narrow elongate pits obscure; legs deep brown to black; posterior basitarsi long and slender, approximately four and one-half times as long as broad. First metasomal tergum very densely, deeply punctate, with shiny interspaces, punctures no more than one-half puncture width apart; second metasomal tergum with punctures much closer and just appreciably finer, tergum sharply depressed basally; metasomal sterna shiny, very

finely and sparsely folliculated; seventh ventral plates sharply emarginate apically, lateral hair bands of seventh ventral plates weakly developed and not broadly united to median band basally, pile of lateral band short and tending to be somewhat appressed rather than erect form as in hyalinus (See fig. 52).

FEMALE: length 8 to 9 mm., wing length 5.5 to 6 mm.

Pile of face long and rather dense about antennal bases and towards inner orbital margins; vertex with pile long, erect, and rather dense in ocellar triangle, dusky to tinged with light ochreus; upper genal areas with pile short, rather dense, and erect, pale grey, occasionally tinged with light ochreus, becoming much longer and whiter below, a broad fringe of appressed, white pubescence immediately posterior to each compound eye; mesoscutum with abundant, dense pale pile about anterior one-third and lateral margins, pile becoming sparser over median discal area; scutellum with a broad fringe of pale pile about lateral and posterior margins; mesepisterna with pile long, fine, dense, pale grey to pure white; propodeum with long fringes of pale grey to dusky pile on latero-posterior margins, fringes longest and most dense on dorsal surface, lateral and posterior faces with a sparse covering of erect, pale pile; anterior two pairs of legs with pile sparse, short, and white, pile long, dense, and extremely plumose on posterior legs, pale grey to tinged with yellowish; first metasomal tergum with apical fascia distinct, lateral fringes of long,

white, pile dense and extending to apical fascia; metasomal terga two to five with fasciae broad, dense, white to tinged occasionally with yellow; second metasomal tergum with a broad basal fascia; metasomal sterna virtually bare.

Antennae reddish brown to deep brown, flagellar segments about as long as broad; malar space one-third as long as broad; clypeus weakly convex, tending to be somewhat flattened medially, very coarsely and irregularly punctate, punctures most dense about basal and frontoclypeal margins, with disc irregularly punctate with shiny interspaces; vertex coarsely and densely punctate, dull; fascial foveae very narrow, extending along upper inner orbital margins to a point just barely above dorsal inner orbital margin. Prothoracic spines long and sharp, at least one and one-half times as long as width across base; mesoscutum rather coarsely and densely punctate over extreme anterior and lateral margins, impunctate area large; scutellum densely punctate about extreme lateral and posterior margins, punctures becoming very sparse over the median discal area, anterior one-third shiny, impunctate; mesepisterna with punctures much as those of mesoscutum, punctures one-half to one puncture width apart, separated by shiny interspaces, punctures becoming finer and sparser below and on the posterior ventral surfaces; propodeum with basal area very shallowly and somewhat obscurely pitted, pits irregular in size, lateral and posterior faces very weakly roughened and dull; wings dusky; legs deep brown to black; posterior basitarsi long, four times as long as

broad. First metasomal tergum strongly punctate, punctures becoming much finer on metasomal tergum two; metasomal sterna two to five shiny, very finely and sparsely folliculated.

This species is divided into four subspecies as follows.

Colletes lutzii lutzii Timberlake

lutzii TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 390-1.

This subspecies is the smallest of the group, occurring in the mountains to the east and northeast of the Great Basin. Only females with the metasomal terga one to four more than half covered with appressed pubescence are designated as lutzii, and only in the females are the subspecific characters evident. The typical specimens of l. lutzii from Colorado have the abdominal terga completely covered with appressed pubescence. A number of specimens taken at Granger, Wyoming, vary in this respect, one specimen having the abdomen as in the typical lutzii while four others have small, narrow, non-pubescent bands between the basal and the apical fasciae.

The male has the pile of face long, dense, and white; vertex with pile dusky; mesoscutum and scutellum with pile long, sparse, and ragged, pure white to pale grey; metasomal terga with pile of apical fasciae and pile covering

first metasomal tergum long, dense, and pure white; mesoscutum very finely and sparsely punctate, punctures one to two puncture widths apart on anterior and lateral faces, impunctate area very large; scutellum with discal area shiny, very sparsely punctate, punctures occurring only on posterior two-thirds and then one to three puncture widths apart; tegulae light hyaline; wings with a sparse covering of light fulvous pubescence, nervures light brown; first metasomal tergum finely and densely punctate, punctures one to one and one-half puncture widths apart.

The female has the vertex with pile white to tawny; mesoscutum with pile pale grey, pile concentrated principally on anterior and lateral margins, with a broad, non-pilose discal area; scutellum with pile long, fine, and pale grey; first metasomal tergum with disc having abundant, appressed, white pubescence, reaching apical fascia; metasomal terga two, to four with broad basal fasciae, fasciae at least covering one-half of the discal area (in a few specimens, the entire discal area is completely covered with appressed, whitish pubescence); clypeus with apical and apico-lateral margins shiny, sparsely punctate with a few coarse punctures; mesoscutum finely and rather densely punctate over anterior and lateral margins, punctures one-half to one puncture width apart, impunctate area large; scutellum with anterior one-half shiny, virtually impunctate; tegulae light hyaline brown; wings dusky with a very weak covering of light fulvous pubescence, nervures

light brown; first metasomal tergum finely punctate, punctures one to three puncture widths apart; second metasomal tergum shiny, coarsely folliculated.

Distribution:

Colorado: Florissant; Grand Junction; Aspen; Great Sand Dunes National Monument; Fort Garland; Ute Creek; Antonito; Maybell; Lay; Eckert; Creeds; Larimer; Cripple Creek; Greeley.

Wyoming: Cheyenne; Granger; Bridger Basin.

Montana: Bozeman.

Utah: Clover; Willow Creek; McCormick; Parawan; Erda; Randolph; Kelton; Lakeview; Nodina; Petersboro; Logan; Emery County.

Idaho: Fort Hall; Castleford; Hollister; Hagerman; Tuttle; Kimama; Milner; Buhl; Oakley; Adelaide; Roseworth; Jerome.

There is one additional specimen taken from Box Butte County, Nebraska, which appears to belong with this subspecies.

In addition a few specimens taken from the extreme eastern portion of Oregon in the vicinity of Lapin and Milton very closely resemble this subspecies and probably represent an area of intergradation between *L. lutzii* and *L. interior*.

Flight Records:

This subspecies has been recorded as flying between

June 10 and August 27.

Plant Records:

Chrysothamnus, Gleome serrulata, Melilotus.

The holotype of this subspecies is located in the American Museum of Natural History.

Colletes lutzii interior Timberlake

monticola interior TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 214.

In the description of monticola interior Timberlake states that it has the punctures of the first tergum "just appreciably finer and sparser" than in m. monticola. This is so in a few specimens, but in others from the same area the puncturation is as coarse as, or even coarser than, in typical monticola. However, the tegulae are lighter in interior and the discal pubescence of the terga tends to a deep ferruginous rather than the black of monticola. From the typical series the description indicates a well-developed basal band or fascia on tergum two and sometimes also on tergum three. In this description Timberlake apparently omitted the specimens from Craters of the Moon, Idaho, and Bend, Oregon, which have well-developed bands on terga two and three and an incomplete or weak band on the fourth metasomal tergum. The female from Craters of the Moon, Idaho, is more typical of the l. lutzii

populations and undoubtedly represents an intermediate form between this and l. interior. The male of interior differs very slightly from monticola and lutzi.

As here understood, the range of interior extends from the type locality, Reno, Nevada, northward into Oregon, Washington, and western Idaho. Timberlake had a number of specimens in his possession which were classified with typical monticola but which exhibits some intergradation with certain characters of the subspecies m. interior and m. inyoensis. These seem to be an intermediate form between the monticola from central California and the interior from the mountains of eastern and northern California and central Oregon, having distinct basal fasciae on metasomal terga two and three and in some cases even four.

The male has the pile of mesoscutum and scutellum dusky to tinged with light ochreous; metasomal terga having fasciae broader, denser, and pure white; first metasomal tergum with pile of disc long, fine, and white, dense and barely obscuring surface; clypeus more densely punctate than in l. lutzi, punctures extending two-thirds of way down towards the apex, apex and apico-lateral portions shiny and sparsely punctate; mesoscutum with punctures dense about anterior and lateral margins, punctures no more than one puncture width apart, impunctate area large; scutellum with the lateral and posterior margins densely punctate, contiguous, and becoming sparser and coarser on discal area, anterior one-quarter shiny, impunctate; tegulae

brownish hyaline; wings dusky with abundant, light fulvous pubescence, nervures brown; propodeum with basal area more deeply pitted than in l. lutzii, pits not uniformly quadrate; first metasomal tergum finely and densely punctate, punctures no more than one puncture width apart.

The female has the pile of face sparse and concentrated about the antennal bases; vertex with pile pale grey to tinged with light ochreus; mesoscutum and scutellum with pile long and dense about anterior, lateral, and posterior margins, median discal areas non-pilose, pile dusky to tinged with light ochreus; first metasomal tergum with apical fascia white, somewhat weakened medially, lateral fringes of long, white pile dense extending to apical fascia, disc with intermixed appressed and erect, whitish pile, concealing no more than half of discal area of first tergum; metasomal terga two to five with apical fasciae broad, dense, and white; second metasomal tergum with a broad, dense, white basal fascia; metasomal tergum three usually with a very narrow basal fascia of white pile; clypeus convex, sparsely punctate over median discal area, with punctures shallow yet coarse; mesoscutum densely and coarsely punctate over the anterior and lateral margins, punctures almost contiguous; scutellum with median discal area coarsely, tending to be weakly striately punctate, anterior one-quarter shiny, impunctate; tegulae brownish hyaline; wings dusky with abundant, fulvous pubescence, nervures brown; first metasomal tergum rather densely

punctate, punctures becoming very fine and sparser medially, punctures one to two puncture widths apart, interspaces shiny; second metasomal tergum with disc finely and rather densely folliculated, dull.

Distribution:

California: Hallelujah Junction, Lassen County; Alta Meadow; Sierraville, Sierra County (paratype).

Nevada: Fallon; Reno (paratype); Lovelock (paratype); Sparks (paratype).

Oregon: Mount Hood; Whitewater Ridge; High Ridges; Parkdale; Sisters; Bend; Lake of the Woods, Klamath County; Tumalo; Deschutes County; Lakeview; Chiloquin; Cloverdale; The Dalles; Hood River; Milton; Redmond; Prineville; Sandy River (paratype); Bend (paratype).

Washington: White Rock Spring; Wawawai; Colokum Pass.

Idaho: Craters of the Moon (paratype).

Flight Records:

The species has been recorded as flying between the 20th of June and the 6th of September, occurring predominantly during July and August.

Plant Records:

Melilotus alba.

The types of this species are located in the collection of the Citrus Experiment Station, Riverside, California.

Colletes lutsi monticola Timberlake

monticola monticola TIMBERLAKE, 1951, Wasmann J. Biol.,
vol. 9, p. 212.

monticola inyoensis TIMBERLAKE, 1951, Wasmann J. Biol.,
vol. 9, p. 215 (new synonymy).

The subspecies m. inyoensis Timberlake described from females taken at Big Pine and Bishop, Inyo County, is an intermediate form between the subspecies monticola and interior and not meritorious of subspecific rank. The puncturation of the first metasomal tergum is intermediate between that of interior and monticola, there is a very weak basal band on tergum three, the discal areas of terga three to six are covered with the deep ferruginous to dark brown, erect pubescence typical of interior, and the tegulae are intermediate amber color between monticola and interior. Equal or greater variation can be discerned in populations of l. monticola, and inyoensis is therefore placed in the synonymy of that subspecies.

The typical series of monticola has a basal fascia on the second metasomal tergum, while on terga three and four the fasciae are absent or barely discernible laterally; the puncturation of the first metasomal tergum is rather sparse but distinct in most of the range, becoming coarser and much denser in the material from the southern mountains of California, reaching its peak in m. pinorum from the San Bernardino and San Jacinto Mountains; the pubescence

of the thoracic terga and the vertex of the head is a yellow ochreous in the southern limits of California, becoming pale ochreous in northern California and tawny grey to white throughout the northern and eastern extent of the range.

The male has the vertex with pile dusky to tinged with ochreous; mesoscutum and scutellum with a dense covering of long, erect, dusky to light ochreous pile; metasomal terga one to five with the apical fasciae very broad, dense, and white; first metasomal tergum with the lateral fringes of long, white pile extending to the apical fascia, disc with abundant, erect, white pile, partially obscuring surface; clypeus finely and densely punctate over basal three-quarters, punctures extending almost to apex along a median longitudinal line; mesoscutum coarsely and densely punctate over anterior and lateral faces, punctures contiguous to one-half puncture width apart; scutellum with discal area sparsely and finely punctate, punctures one to three puncture widths apart, anterior one-quarter shiny, impunctate; tegulae brownish hyaline; wings dusky with abundant, deep fulvous pubescence, nervures dark brown; propodeum with basal area dull with numerous, elongate, narrow pits, pits shallow; first metasomal tergum densely and rather coarsely punctate, punctures becoming finer and slightly sparser medially, punctures no more than one puncture width apart; second metasomal tergum finely and densely punctate, punctures one-half puncture width apart,

with shiny, linear interspaces.

The female has the pile of face and vertex tinged with light yellow; mesoscutum and scutellum with pile long, dense, and tinged with light ochreous; first metasomal tergum with apical fascia weak and whitish, the disc with an admixture of appressed and erect, whitish pile, concealing only extreme anterior portion of disc; metasomal terga two to four with apical fasciae broad, dense, and white; second metasomal tergum with a broad basal fascia of pure white pubescence; metasomal tergum three with a very faint trace of a basal fascia; clypeus shiny black, coarsely and striately punctate, particularly over basal two-thirds and lateral margins, median apical portion shiny, impunctate; mesoscutum very densely and coarsely punctate over anterior one-half and lateral margins; scutellum shiny, sparsely and finely punctate; tegulae deep brown hyaline; wings dusky with abundant, deep fulvous pubescence, nervures dark brown; first metasomal tergum densely punctate, punctures one-half to one puncture width apart; second metasomal tergum finely and densely punctate, punctures approximately one puncture width apart.

Distribution:

California: Log Meadow, Sequoia National Park; Wolverton Creek, Sequoia National Park; Dorst Camp, Three Rivers and Mineralking, Tulare County; Huntington Lake, Paradise Valley, near Nellie Creek, and Bubbs Creek, Fresno County; Grant Lake, Mammoth and Deadman's Creek,

Mono County; Lone Pine and Bishop, Inyo County;
Lake Tahoe; Carson Pass.

Flight Records:

The species flies from June 1 to September 11.

Plant Records:

Castanopsis; Chrysothamnus; Solidago elongata.

The holotype is located in the Citrus Experiment
Station, Riverside, California.

Colletes lutzi pinorum Timberlake

monticola pinorum TIMBERLAKE, 1951, Wasmann J. Biol.,
vol. 9, p. 215.

This subspecies represents the southern known extremity
of lutzi and differs from the l. monticola only in the
coarser and closer puncturation of the abdomen, especially
tergum one. There is a very faint trace of a basal fascia
on metasomal tergum three in females from Pine Knot, which
is not discernible in females from Hemet Reservoir. The
puncturation referred to is coarser and closer in the
Hemet specimens but the subspecies approaches the l.
monticola in the females from Pine Knot. The puncturation
of the first metasomal tergum in the males is coarser and
denser than l. monticola.

The male is much as in monticola except in having the

clypeus a little more coarsely punctate; first metasomal tergum more densely and deeply punctate, punctures contiguous to one-half puncture width apart; second metasomal tergum with punctures almost contiguous on anterior and median portions; metasomal tergum three deeply and rather densely punctate, punctures no more than one-half puncture width apart.

The females are as in monticola except in having the clypeus coarsely and densely punctate over basal half and striately punctate to apex; first metasomal tergum dull, very densely and deeply punctate, punctures one-half to one puncture width apart; second metasomal tergum finely and densely punctate, contiguous towards anterior margins where punctures are much finer, dull; metasomal tergum three very finely and densely folliculated, surface dull.

Distribution:

California: Keen Camp (holotype and allotype); Henset Reservoir, and Idyllwild in the San Jacinto Mountains; Bear Valley, Pine Knot, South Fork Camp, Rathbon Creek and Big Bear Lake in the San Bernardino Mountains.

Flight Records:

The species has been recorded from June 10 to September 10.

Plant Records:

Aster; Cryptantha; Eriogonum molestum var. dauidsonii;

Gnaphalium thermale; Hemizonia wheeleri; Layia platyglossa.

The types of this species are located in the Citrus Experiment Station, Riverside, California.

Colletes distinctus Cresson

distinctus CRESSON, 1868, Proc. Boston Soc. Nat. Hist., vol. 12, p. 167; ROBERTSON, 1895, Trans. Amer. Ent. Soc., vol. 22, p. 115; COCKERELL, 1905, Psyche, vol. 12, p. 87; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 36; CRESSON, 1916, Mem. Amer. Ent. Soc., vol. 1, p. 107; GRAENICHER, 1930, Ann. Ent. Soc. Amer., vol. 23, p. 154.

ilicis MITCHELL, J. Elisha Mitchell Sci. Soc., vol. 67, p. 234-6 (new synonymy).

Swenk in 1908 indicated nitidus Smith to be a synonym of distinctus on the basis of Smith's description. His illustration of the seventh ventral plate and description of the species is not that of distinctus but would appear to be more like that of carolinus Mitchell. I have not had opportunity to have carolinus compared with the type of nitidus but it is quite probable that carolinus may be a synonym of this poorly-known species. Examination of Mitchell's specimen determined as distinctus convinces me that he followed the Swenk determination, for the males proved to be the undescribed sex of his new species carolinus.

Swenk states that distinctus was described by Mr. Cresson from a single male specimen collected by Mr. James Ridings in Georgia. Concerning this Mr. J. A. G. Rehn of the Academy of Natural Sciences of Philadelphia writes, "I do not know on what authority Swenk said that this species was originally described on a single male specimen. The original description gives no information on that point and the type and paratype here have the same kind of printed Georgia label as many other specimens we have which were collected by Mr. James Ridings as the original material of distinctus was said to be. Also bearing on this is the fact that Mr. E. T. Cresson Sr. was responsible for labeling the other specimen we now have as paratype."

The species is a member of the hyalinus group found along the Atlantic seaboard from Florida to Michigan. The male differs from hyalinus in having the posterior and lateral faces of the propodeum deeply and rugosely pitted, with shiny surfaces; the mesepisterna rugosely punctate; the malar space one-half as long as wide; and in having the first metasomal tergum sparsely folliculated. In the females the last metasomal sternum has raised lateral longitudinal ridges converging apically. The present work extends the range to Michigan, New York, and North Carolina.

MALE: length 9 mm., wing length 7 mm.

Pile of face long, dense, and tinted with ochreous completely covering clypeus; pile of vertex sparse, light

ochreous with no dark pile intermixed; pile of the mesoscutum tawny to tinged with light ochreous erect and with no black hairs but a few deeper ochreous hairs intermixed particularly on median surfaces; scutellum covered much as the mesoscutum; pile of mesopleura long, erect, plumose, and pale grey; propodeum with a rather dense clump of long, light ochreous pile along dorsal lateral margin; legs with the pile short, a pale grey to very light ochreous, not at all concealing surface; metasomal fasciae weak and very slightly tinged with light ochreous; first metasomal tergum with a lateral fringe of pile extending down to apical fascia, a few erect, pale grey hairs on disc; metasomal sterna with apical fasciae composed of a weak fringe of light ochreous pile becoming very weak medially.

Antennae long, deep brown, flagellar segments one and one-half times as long as broad; malar space one-half as long as broad; clypeus weakly convex, densely punctate over basal one-half tending to be striately punctate apically; vertex very closely and densely punctate, dull. Prothoracic spines long and sharp, approximately one and one-half times as long as width across base; mesoscutum coarsely punctate with shiny interspaces, punctures not at all rugose, impunctate area small; scutellum very coarsely punctate, not striate, a weak longitudinal median sulcus extending length of scutellum; mesepisterna very coarsely, rugosely punctate, almost appearing pitted on upper surfaces, punctures becoming sparser and finer below; metapleuron very

rugosely pitted on upper one-half; propodeum deeply and densely pitted over lateral and posterior faces, pits shiny, basal area with deep, shiny, quadrate pits; tegulae brown; wings with testaceous pile giving them a dusky appearance, nervures brown to deep brown; legs a deep reddish brown; posterior basitarsi four times as long as broad. First metasomal tergum shiny with a few sparse follicles becoming slightly denser laterally where they are in densest area no less than three to four follicle widths apart, apical margins of metasomal terga weakly depressed, most evident laterally and tend towards hyaline-ness; seventh ventral plates much as in hyalinus, however slightly broadened on lateral aspects and with narrow non-plumose, non-pilose, testaceous rims laterad of descending hair bands.

FEMALE: length 11 mm., wing length 7.5 mm.

Face with sparse, light pile, not at all concealing surface; a few pale grey hairs in ocellar region of vertex, a few appressed, short, white hairs medially posterior to compound eyes, hair becoming much longer and more erect on lower surface of genal areas; mesoscutum and scutellum with pile rather short, pale grey, no evidence of black hairs intermixed; mesepisterna with pile long, plumose, and rather sparse; pile of legs sparse and pale grey to light ochreous except on posterior tibiae and tarsi, where a few darker, almost black hairs are intermixed on upper surfaces; metasomal tergum one with a very weak apical

fascia, evident only laterally, a rather weak fringe of short, white pile extending almost to apical fascia; terga two to five with fasciae tending to become broader and more dense, pile is pure white; metasomal terga four to six with disc covered with semi-erect, deep ochreous pile; sternal fasciae absent except for a few sparse, long hairs on apical half of disc.

Antennae long, deep brown, flagellar segments about as long as wide; malar space one-third as long as broad; clypeus weakly convex and striately punctate to apex; vertex rather deeply and coarsely punctate with shiny interspaces; fascial foveae deep and uniformly broad to vertex where upper ends reach two-thirds of way to lateral ocelli. Prothoracic spines triangular forming roughly an equilateral triangle; mesoscutum densely punctate over anterior one-half and lateral margins, impunctate area large and shiny; scutellum with punctures much coarser than those on mesoscutum, not striate; a weak, longitudinal, median sulcus extending length of scutellum; mesepisterna, as in male, coarsely, rugosely punctate on upper surfaces, becoming sparser below, with shiny interspaces; propodeum with basal area deeply pitted, with elongate, quadrate pits, upper surface of lateral and posterior faces very deeply, rugosely pitted, pits becoming shallow or absent on lower portions; tegulae deep brown, nervures deep brown, wings with surface dusky to testaceous, having abundant short, brown pile concentrated principally at apical ends;

legs dark black, posterior tibiae with a weak, shallow, longitudinal excavation on upper posterior surface; posterior basitarsi three times as long as broad. Metasomal terga shiny, impunctate, a few follicles about extreme apical margin of first metasomal tergum; metasomal terga two to five shiny black with a few sparse follicles on discal area; metasomal sterna with a very weak, hyaline rim at apex of sterna two to five, discal areas indistinctly punctate; last metasomal sternum with weak lateral elevated longitudinal ridges converging apically but not meeting.

Distribution:

Michigan: Sand Point, Huron County; Lake County; State Game Refuge, Tusco County.

New York: Mosholu.

New Jersey: Ramsey.

North Carolina: Ivanhoe; Holly Shelter; Spout Springs.

South Carolina: McClellanville.

Georgia: Ga. (paratype); Bartow.

Florida: Jacksonville; Crescent City.

Flight Records:

April 12 to July 21.

Plant Records:

Ilex glabra.

The holotype is located in the Academy of Natural Sciences of Philadelphia.

Colletes phaseliae Cockerell

phaseliae COCKERELL, 1906, Ann. Mag. Nat. Hist., ser. 7, vol. 17, p. 315; COCKERELL, 1906, Ann. Mag. Nat. Hist., ser. 7, vol. 18, p. 74; COCKERELL, 1906, Bull. Amer. Mus. Nat. Hist., vol. 22, p. 424; COCKERELL, 1907, Univ. Colorado Studies, vol. 4, p. 240; GIBSON and CRIDDLE, 1920, Rept. Ent. Soc. Ontario, vol. 20, p. 132; COCKERELL, 1931, Amer. Mus. Nov., no. 397, p. 5; COCKERELL, 1933, Ann. Ent. Soc. Amer., vol. 26, p. 43; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 388.

salicicola geranii COCKERELL, 1906, Canadian Ent., vol. 38, p. 163; COCKERELL, 1906, Bull. Amer. Mus. Nat. Hist., vol. 22, p. 424; COCKERELL, 1907, Univ. Colorado Studies, vol. 4, p. 240; GIBSON and CRIDDLE, Rept. Ent. Soc. Ontario for 1910, p. 19; COCKERELL, 1911, Canadian Ent., vol. 43, p. 33; COCKERELL, 1919, Canadian Ent., vol. 51, p. 27; COCKERELL, 1930, Amer. Mus. Nov., no. 397, p. 5; COCKERELL, 1933, Ann. Ent. Soc. Amer., vol. 26, p. 43; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 388.

This species occurs in the western portion of the Great Plains, through the northern parts of the mountains into eastern Washington and Oregon as well as the valleys of southern British Columbia. It is presumably an inhabitant of the semi-arid regions. The males can readily be distinguished in having a very long malar space, usually as

long as wide, and in having the basal area of the second metasomal tergum strongly depressed with long white pile in the form of a weak, although not appressed, basal fascia. The females are easily confused with lutzi, from which they can be distinguished only with difficulty. G. phaceliae is larger, 9.5 to 10.5 mm., and has the malar space one-third as long as wide; specimens from Utah, Idaho, Washington, and Alberta have the abdominal terga covered much as in lutzi, but generally the pile is much coarser and most sparse at the extreme lateral faces of each disc. In lutzi the females rarely exceed 7.5 mm. in length, although a few do reach 8 mm.; the malar space is shorter, one-quarter as long as broad; and the metasomal terga are covered with fine white pile which tends to be most dense and most extensive at the lateral extremities of each disc.

Considerable variation exists in the species over its wide range. The males from the most easterly regions have the puncturation of the first metasomal tergum fine, with punctures approximately two puncture widths apart, while in specimens from the far west the punctures are denser and coarser, no more than one puncture width apart in some.

In the females the pattern of metasomal pubescence undergoes the greatest variation. Those occurring in the western Great Plains are invariably more sparsely covered than those found in the northwestern states. Minimum coverage observed on over 700 specimens examined has the

first, second, and third metasomal terga with the basal one-half concealed by appressed white pubescence. The basal and apical fasciae of each tergum are approximately the same width. Maximum pubescent covering was observed on two females from Washington, which have the discs of the metasomal terga one to four completely concealed by appressed white pubescence. Various intergradations between these two extremes have been examined and it is difficult, if not impossible, to establish an intelligible cline, although generally the amount of appressed pubescence increases in the north and northwestern portions of the range.

MALE: length 8.5 mm., wing length 6 mm.

Face with pile very long, dense, and pure white, tending to semi-appressed along inner orbital margins, completely concealing clypeus; vertex with pile white to tawny; genal areas with pile dense, long, and pure white, a weakly appressed rim just posterior to compound eyes; mesoscutum with pile pure white; scutellum with pile long, dense, and weakly plumose; mesepisterna with pile long, fine, and pure white; propodeum with weak latero-posterior clumps of pile barely distinguishable from long, white, erect pile covering on lateral and posterior faces; legs with pile long, sparse, and pure white; metasomal terga one to six with very broad apical fasciae of pure white pubescence; first metasomal tergum with strong lateral fringes of white pile, anterior face and disc with abundant,

long, erect, white pile; second metasomal tergum with basal area having abundant, shorter, white, erect hairs, forming a very weak basal fascia in depression; metasomal terga three to six with discs having shorter, erect, white pile, giving surface whitish sheen; metasomal tergum seven with pile light ochreous and appressed; metasomal sterna two to four with broad, dense apical fasciae slightly broadened medially.

Antennae long, reddish brown, flagellar segments one and one-half times as long as broad; malar space as long as broad; clypeus finely punctate over basal one-half, punctures sparse to absent apically with broad shiny impunctate areas; vertex dull, finely and densely punctate. Prothoracic spines long and sharp, about twice as long as width across base; mesoscutum finely and densely punctate, punctures one puncture width apart on anterior and lateral faces, small impunctate area; scutellum finely and densely punctate on posterior and lateral margins, interspaces shiny on median discal area, weak longitudinal median groove; mesepisterna finely and densely punctate, punctures one-half puncture width apart to one puncture width apart below; propodeum with the basal area narrow, quadrately pitted with elongate pits, lateral and posterior faces shiny and weakly roughened, not striate or rugose, lateral posterior margin weakly rounded; tegulae light hyaline brown; wings whitish hyaline with little light apical pubescence, nervures light brown; legs deep brownish black; posterior

basitarsi four and three-quarters times as long as broad. Metasomal tergum one with punctures one to two puncture widths apart, most dense on lateral margins; metasomal tergum two with punctures finer and denser, about one puncture width apart, a deep, sharp basal depression; metasomal tergum three with punctures very fine and dense; metasomal sterna shiny, finely and sparsely folliculated; seventh ventral plates as illustrated.

FEMALE: length 10 mm., wing length 7.5 mm.

Face with pile most dense about antennal bases and along frontal areas, pile pale grey to white; clypeus with few fine hairs, not concealing surface; vertex with pile tinged with ochreus, and dense; genal areas with upper surface having abundant, long, ochreus pile, becoming much longer, finer, and pure white on lower surfaces, a dense mat of appressed pile posterior to compound eyes; mesoscutum with pile long, dense, and tinged with ochreus; scutellum with pile lighter, longer, and more plumose than on mesoscutum; mesepisterna with long, fine, white pile partially concealing surface, slightly ochreus above; propodeum with dense latero-posterior fringes of long white pile extending down latero-posterior margin to pedicle, lateral faces having a few, short, white, appressed hairs, posterior face with abundant, long, erect pile; legs with pile white to light ochreus, long and plumose on posterior femora and tibiae; metasomal terga one to five with very broad, dense apical fasciae of pure white pile; metasomal

tergum one with surface almost completely concealed with long, dense, appressed pile, faintly tinged with ochreous, anterior face with many erect white hairs; metasomal tergum two with very broad basal fascia of pure white pile, slightly broader than apical fascia, leaving only narrow non-pubescent rim; metasomal tergum three with basal fascia as broad as apical, leaving weakly pubescent rim between the two fasciae; metasomal tergum four with few, scattered, short, white, appressed hairs forming very weak basal fascia; metasomal tergum six with deep brown to black appressed pile; metasomal sterna non-fasciate with a few light ochreous hairs.

Antennae reddish brown, flagellar segments about as long as broad; malar space three-eighths as long as broad; clypeus weakly convex with coarse, striate punctures, most dense about basal portion, becoming larger and more striate apically; vertex shiny with few fine punctures. Prothoracic spines long and sharp, almost twice as long as width across base; mesoscutum densely punctate with punctures less than one-half puncture width apart about anterior and lateral margins; scutellum with punctures dense, almost contiguous on lateral and posterior margins, becoming sparser toward anterior margin which is almost impunctate; mesepisterna deeply punctate with punctures no more than one-half puncture width apart, interspaces shiny; propodeum with the basal area shallowly pitted with elongate, irregular pits, lateral and posterior faces shiny and weakly roughened, not

striate or rugose; tegulae light hyaline brown; wings whitish hyaline with short, scattered, brown apical pubescence, nervures light brown; legs deep brownish black; posterior basitarsi four times as long as broad. Metasomal tergum one densely punctate beneath appressed white pubescence, punctures about one puncture width apart, sparser toward anterior face; metasomal tergum two with punctures fine, dense, and no more than one puncture width apart; metasomal terga three to five finely folliculated; metasomal sterna finely and densely folliculated.

Distribution:

The species abounds in Washington, Oregon, Idaho, Utah, Wyoming, Colorado, North and South Dakota, Nebraska, and Minnesota.

Marginal records include:

British Columbia: Osoyoos; Penticton; Okanagan Falls; Fairview.

Alberta: Medicine Hat; Scandia; Countess; Wild Horse; Waterton Lakes; Tilley; Orion.

Saskatchewan: Swift Current; Eastland; Saskatoon.

Manitoba: Lyleton; Hartney.

Montana: Marias River; Helena.

Iowa: Sioux City.

Kansas: Clark County; Hamilton County.

New Mexico: Tajique; Las Vegas; Pecos; Carizozo; Jemez Mountains; Vaughan; Raton.

Arizona: Marble Canon; Kayenta; Cedar Ridges.

Nevada: Austin.

California: Sierraville, Sierra County.

Flight Records:

This is an aestival species, having been recorded between May 21 and September 27 with main flights occurring during July, August, and early September.

Plant Records:

Aster, Cleome serrulata, Epilobium spicatum, Grindelia,
Gutierrezia, Helenium laciniatum, Malvastrum coccineum,
M. cockerelli, Helilotus alba, Petalostemon, Phacelia,
Psoralea venuliflora, Ribes, Senecio douglasii, Solidago,
Tetradymia spinosa.

The holotype is located in the collection of the Citrus Experiment Station, Riverside, California.

GROUP X - inaequalis

Colletes inaequalis Say

inaequalis SAY, 1837, Boston J. Nat. Hist., vol. 1, p. 391; LECONTE, 1859, Writings of the Say Ent., vol. 2, p. 270; PATTON, 1879, Proc. Boston Soc. Nat. Hist., vol. 20, p. 142; ROBERTSON, 1895, Trans. Amer. Ent. Soc., vol. 22, p. 115; BRIDWELL, 1899, Trans. Kansas Acad. Sci., vol. 16, p. 210; COCKERELL, 1901, J. New York Ent. Soc., vol. 9,

p. 132; SMITH, 1901, J. New York Ent. Soc., vol. 9, p. 134; ROBERTSON, 1904, Canadian Ent., vol. 36, p. 275; COCKERELL, 1905, Psyche, vol. 12, p. 86; ROBERTSON, 1906, Science, vol. 23, p. 309; BRITTON and VIERECK, 1906, Rept. Connecticut Agr. Exper. Sta., pt. 4, p. 210; LOVELL, 1907, Canadian Ent., vol. 39, p. 364; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 28; SMITH, 1910, Ann. Rept. New Jersey State Mus., for 1909, p. 695; BANKS, 1912, Ent. News, vol. 23, p. 107; COCKERELL, 1912, Ann. Mag. Nat. Hist., ser. 8, vol. 9, p. 382; LOVELL, 1913, Psyche, vol. 20, p. 147; VIERECK, 1916, Connecticut Geol. Nat. Hist. Survey Bull., vol. 22, p. 740; CRESSON, 1916, Mem. Amer. Ent. Soc., vol. 1, p. 108; SLADEN, 1919, Canadian Ent., vol. 51, p. 124; RAU, 1922, Trans. Acad. Sci. St. Louis, vol. 24, p. 38; LEONARD, 1926, Cornell Agric. Exper. Sta. Mem., no. 101, p. 1021; ROBERTSON, 1926, Psyche, vol. 33, p. 116; ROBERTSON, 1928, Flowers and Insects, p. 9; PHILLIPS, 1933, J. Agric. Res., vol. 46, p. 860; RAU, 1933, Trans. Acad. Sci. St. Louis, vol. 28, p. 219; GRAENICHER, 1935, Ann. Ent. Soc. Amer., vol. 28, p. 301; PEARSON, 1935, Ecological Mono., vol. 3, p. 384; BRIMLEY, 1938, Insects of North Carolina, p. 451.

propinqua CRESSON, 1868, Proc. Boston Soc. Nat. Hist., vol. 12, p. 165.

compactus SMITH (not Cresson), 1900, J. New York Ent. Soc., vol. 8, p. 208; SMITH, 1901, J. New York Ent. Soc., vol. 9, p. 30.

canadensis CRESSON, 1868, Proc. Boston Soc. Nat. Hist.,

vol. 12, p. 166; ROBERTSON, 1895, Trans. Amer. Ent. Soc.,
vol. 22, p. 115; CRESSON, 1916, Mem. Amer. Ent. Soc.,
vol. 1, p. 107.

inaequalis ferrugineus SWENK, 1908, Univ. Nebraska
Studies, vol. 1, p. 32; SMITH, 1910, Ann. Rept. New Jersey
State Mus., 1909, p. 695. (new synonymy)

The species is closely related to thoracicus Smith and
at times both sexes are difficult to distinguish. The males
of inaequalis are genitally distinct from those of
thoracicus and can usually be distinguished by having a
mixture of black pile on the posterior portion of the meso-
scutum and on the discal area of the scutellum; the first
metasomal tergum of inaequalis is always more deeply and
densely punctate with punctures one to two puncture widths
apart, while the thoracicus males have the tergum shiny,
sparsely and shallowly punctate. The females of inaequalis
have a very dense covering of long, black pile especially
on the scutellar disc, while in thoracicus the scutal and
scutellar areas are covered with ferruginous to deep
ferruginous pile. In many specimens of thoracicus from
Texas and the southern states, the pile of the scutellum is
so deeply ferruginous that it may appear as dark brown or
black pile unless examined closely. In the female, as in
the male, the first metasomal disc is almost impunctate
and the posterior tibiae have a deep longitudinal sulcus
on the dorsal surface running almost the entire length of
the tibia, this sulcus is absent in inaequalis.

The type and the paratypes of inaequalis ferrugineus Swenk have been examined, and I do not consider it to be worthy of subspecific rank. Swenk describes specimens from Willis, Texas, and from Hainsport, New Jersey, as members of the new subspecies and states that he is "inclined to consider it a geographic variant probably restricted to the southern coast portion of the range of the species." Further material from New Jersey, District of Columbia, North Carolina, Georgia, and parts of Texas would indicate that the specimens Swenk used in his descriptions are merely individual variants rather than separate populations. The entire series from Willis, Texas, was caught at the same place and on the same day. That the color of the pile of the body is deep ochreous and distinctive is undeniable, but there is no evidence from other specimens that this is a good subspecific character, for material from Kansas, Ohio, New York, Quebec, North Carolina, and New Jersey shows that the intensity of the color of the pile varies considerably from the pure grey or tawny of the typical inaequalis, as described from Indiana, to the deep ochreous pile as found in specimens described by Swenk. All of the Swenk material appears to have been newly emerged, for there is very little pile worn from the body. The cause of the color variation eludes me, but in many of the newly-emerged "unworn" specimens there is a distinct ferruginous cast. The species varies little despite its wide distribution. The northern representatives from Manitoba, Saskatchewan,

and westward into the State of Washington show a greater predominance of white pile on the thoracic terga than do the more eastern members. Other than this minor deviation there appears to be no evident geographical variation.

MALE: length 12 mm., wing length 8 mm.

Face with pile long and pure white, evenly distributed about antennal bases, along inner orbital margins, and over clypeus; vertex with pile white; occiput with pile long, white, and plumose, longest about lower occipital regions; mesoscutum with pile white anteriorly, becoming pale grey toward posterior face of mesoscutum, a few, scattered, dark hairs on posterior disc; scutellum with pile pale grey and with mixture of long, black hairs about medial discal area and at posterior face; mesepisterna with pile very fine, long, and white; legs with pile fine, sparse, and white; metasomal terga one to five with weak, white apical fasciae, very often interrupted medially due to abrasion; first metasomal tergum with weak lateral fringes, discal area and anterior face with abundant, long, fine, white pile not concealing surface; metasomal terga two to five with discs having sparse, fine, white pile; metasomal tergum six with pile appressed, white to pale grey; metasomal sterna with weak apical fasciae longest at lateral faces, very short or absent medially.

Antennae long, reddish brown, flagellar segments one and one-half times as long as broad; malar space seven-eighths as long as broad; clypeus weakly convex, dull,

closely, shallowly punctate giving surface roughened, dull appearance; vertex dull and closely, shallowly punctate. Prothoracic spines absent; mesoscutum closely, shallowly punctate with coarse punctures no more than one-half puncture width apart over anterior and lateral faces; scutellum with punctures deep, weakly striate, and very dense, almost contiguous at posterior margin; mesepisterna dull, shallowly and closely punctate with large punctures; propodeum with basal area irregularly pitted, lateral and posterior faces dull, very finely roughened, not at all striate or rugose; tegulae light brown; wings dusky with abundant, short, brown pubescence, most dense apically, nervures light brown basally, becoming deeper brown apically; legs deep reddish brown on anterior two pairs, posterior pair brown; hind basitarsi very long, four and one-half times as long as broad. Metasomal terga one and two shiny, deeply and densely punctate with punctures approximately one puncture width apart; metasomal terga three to five more shallowly and obscurely punctate with shiny interspaces; metasomal sterna shiny and sparsely folliculated; seventh ventral plates trilobate with median lobe strongest, lobes truncate apically (See fig. 55).

FEMALE: length 13 mm., wing length 10 mm.

Face with pile long, fine, and erect about antennal bases; vertex with mixture of black and ochreous pile, black pile extending down on to supra-antennal areas and along upper inner orbital margin; mesoscutum with strong mixture

of black and ochreous pile; scutellum with abundant, long, black pile over entire discal area with a few, light ochreous hairs most evident about lateral and posterior margins; mesepisterna with the pile pale grey to white below, long and fine but not concealing surface; legs with pile light ochreous on femora and tibiae, occasionally a few, deep ochreous, short, spine-like hairs on basitarsi and tibiae; metasomal terga one to five with weak, pure white apical fasciae, very often absent medially due to wearing; first metasomal tergum with weak lateral fringes of pale grey pile extending to apical fascia, disc and anterior face with abundant, fine, erect, white to pale grey pile not concealing surface; metasomal terga two to five with discs having few, very short, erect, pale grey hairs, a few longer, deep ochreous hairs appearing on discs four and five; metasomal tergum six with pile appressed, deep ochreous to ferruginous; metasomal sterna with no apical fasciae, discs with posterior margins having a weak covering of erect, ochreous pile.

Antennae reddish brown, flagellar segments about as long as wide; malar space about one-half as long as broad at anterior mandibular articulation, two-thirds as long as broad at posterior mandibular articulation; clypeus bare, deeply striately punctate with shiny interspaces, punctures well separated on lateral margins and much closer on shallowly concave medial area; vertex dull, closely and finely punctate. Prothoracic spines absent; mesoscutum with deep, dense punctures no more than one-half puncture width apart

except on posterior medial area where they may be one puncture width apart; scutellum impunctate on extreme anterior margin, becoming deeply striately punctate over posterior two-thirds of disc; mesepisterna dull, obscurely, shallowly punctate; propodeum with basal area narrow, sloping sharply ventrally, shallowly pitted, lateral and posterior faces dull, roughened, not at all striate or rugose; tegulae brown; wings dusky with abundant, short, brownish pubescence especially apically, nervures dark brown; anterior two pairs of legs deep reddish brown, posterior pair brown; posterior basitarsi three and one-half times as long as broad. First metasomal tergum distinctly punctate with punctures approximately one puncture width apart except toward the apical margin where punctures are much finer and closer; metasomal terga two and three densely folliculated; metasomal sterna shiny with hyaline apical margin, discal area coarsely folliculated on sterna two to five.

Distribution:

The species is the most common member of the genus in America east of the Great Divide and has been recorded from all states and provinces bounded by the following marginal localities: Saskatoon, Saskatchewan; Onah, Manitoba; Spencerville, Ontario; College St. Alexandre, Quebec; Ann County, Nova Scotia; Clayton, Georgia; Marion County, Arkansas; Dallas, Texas; Manhattan, Kansas; Elmore, Idaho, and Cashmere, Washington.

Flight Records:

This is a vernal species, flying as early as March 5 in the southerly limits of its range to June 18 in the northern extremities. Swenk reports: "Occasionally individuals of this species emerge in the fall -- I have examined two females from Grand Rapids, Michigan, labeled "11-19-1889", a female from Durham, New Hampshire, taken October 5, 1899, on Aster, and a male taken at Germantown, New Jersey, "11-1-1905" by Mr. H. S. Harbeck. These autumnal specimens are, however, rare, and are to be viewed as abnormally accelerated individuals rather than indicating a fall brood of the species." His conclusion is undoubtedly correct, for of the 750 specimens examined none have been taken later than early June.

Plant Records:

This polytropic species has been recorded as visiting: Acer, Aesculus glabra sargentii, Anemone virginiana, Arctostaphalus, Cercis canadensis, Claytonia palustris, Dendrium buxifolium, Dentaria, Lomatium foeniculaceum, Frunus, Pyrus ioensis, Rhamnus utilis, Rhus canadensis, R. aromatica, Ribes, Rubus, Salix, Spiraea vanhouttii, S. thunbergi, Taraxacum, Viburnum acerifolium.

Again quoting from Swenk (1908): "This was the first Colletes to be described from North America. It was characterized and named by Say in 1837 from specimens taken in Indiana. His description being rather short and general,

some confusion as to the correct identity of his species resulted from the loss of the type, so that Mr. Cresson redescribed it in 1868 under the name propinqua, doubtfully identifying another species (armatus Patton) as inaequalis. Eleven years later Mr. Patton placed it under its proper name, showing propinqua to be a synonym, and redescribed Cresson's inaequalis as armata. Mr. Charles Robertson, in corroboration of Patton's identification of inaequalis, wrote in 1895: 'Say says that his species flies in March and April. I have taken it from the 20th of March to the 28th of May, while the species which Cresson has doubtfully referred to C. inaequalis I have taken only from the 30th of August to the 7th of October. This early species which agrees with Say's description of C. inaequalis, I have compared with the types of C. propinqua in the collection of the American Entomological Society. I have also examined the types of C. canadensis. A specimen which Mr. Cresson doubtfully referred to C. canadensis is nothing, I think, but C. inaequalis.' At my request Mr. Viereck kindly compared the types of propinqua and canadensis and he also considers them as quite identical." Unfortunately, there is very little Indiana material in my possession and these few specimens are either damaged or otherwise unsuited to neotype designation. I have chosen a male and a female from Columbus, Ohio, to represent this species as the neotypes. The specimens, while not strict topotypes, are regionally toptypical.

Neoholotype: female: Columbus, Ohio, May 19, 1902

(Bridwell).

Neocallotype: male: Columbus, Ohio, May 3, 1902

(Bridwell).

The neotypes are in the collection of the United States Museum.

Colletes thoracicus Smith

thoracica SMITH, 1853, Cat. Hymen. British Mus., vol. 1, p. 5; GRESSON, 1868, Proc. Boston Soc. Nat. Hist., vol. 12, p. 171; ROBERTSON, 1895, Trans. Amer. Ent. Soc., vol. 22, p. 116; SMITH, 1901, J. New York Ent. Soc., vol. 9, p. 134; COCKERELL, 1904, Ent. News, vol. 15, p. 276; COCKERELL, 1905, Psyche, vol. 12, p. 85; SMITH, 1910, Ann. Rept. New Jersey State Mus. for 1909, p. 695; BRIMLEY, 1938, Insects of North Carolina, p. 451.

pulcher SWENK, 1906, Canadian Ent., vol. 38, p. 43.

rufithorax SWENK, 1906, Canadian Ent., vol. 38, p. 42; SMITH, 1910, Ann. Rept. New Jersey State Mus. for 1909, p. 695; PARKER and BOVING, 1924, Proc. U. S. Nat. Mus., vol. 64, p. 2.

The original description is based on specimens taken from New Jersey, North Carolina, and Florida, and agrees closely with C. rufithorax Swenk and C. pulcher Swenk. Observations made on the types of this species by Dr. Yarrow

of the British Museum would tend to substantiate this synonymy. In 1906 Swenk described two species in the same paper, Q. rufithorax and C. pulcher. I have examined the type of pulcher and find it, except for size, identical with a co-type of rufithorax taken from the same locality (Fedor, Texas) two days later. Swenk appears to base a great deal of significance on the size in both of these species, but I find that this character is extremely variable. Material collected in Washington, D. C., and in North Carolina at what appear to be identical times illustrates overall length variations from 9.5 to 13 mm. The great majority of the material from Texas and Louisiana is larger than its eastern counterparts but there is still the same degree of variability in length, than 10 to 15 mm. Additional divergence exists in the colour of the thoracic pile of the males, which may range from tawny grey to light ochreous, irrespective of geographical loci.

The factors influencing the variation exhibited by the lateral portions of the seventh ventral plates of the male are not known. The plate is basically of the inaequalis type but has the lateral wings of the trilobate process broadly attached basally. This point of attachment to the main median process fluctuates, at times having the lateral lobe as a long process overlapping basally and free apically whereas in other specimens from the same locality the lateral process is united to the median along its entire length, leaving an apex of only two processes. For the present I

shall attribute this to a simple genetic factor. The fasciae of the metasomal terga are absent in the female and may be evident as traces of tawny to light ochreous pile on the lateral portions of each segment. In the male the fasciae are usually present, weak but broad; however in many specimens they may be removed very easily by rubbing and are evident only laterally and in a few specimens have been completely removed.

MALE: length 12 mm., wing length 9 mm.

Pile of face long, moderately dense over clypeus and antennal bases, pile pale grey to tinged with light ochreous above; vertex with pile long and tinged with ochreous, concentrated principally in ocellar triangle; genal areas with upper surface having abundant, short pile, pile pale grey, becoming much more erect, longer, and whiter below; meso-scutum with pile long, dense, and light ochreous over entire surface; scutellum with pile longest and most dense about lateral and posterior margins, pile becoming sparser and shorter on discal area; mesepisterna with pile long, fine, and pale grey, propodeum with dense fringes of long, dusky to tinged with light ochreous pile on latero-posterior margins, being most dense on upper surfaces, lateral and posterior faces with a sparse covering of erect, pale grey pile; pile of legs long, very sparse, and pale grey, a few darker hairs, principally ochreous, on tibiae; first metasomal tergum with the apical fascia broadly interrupted, evident

only as a weak lateral portion, pubescence pale grey, lateral fringes of pale grey pile weak, extending to apical fascia, disc with abundant, erect, pale grey pile; metasomal terga two to five with fasciae very weak and white, fasciae broadly interrupted on second metasomal tergum and just barely present on median portion of terga three and four; metasomal terga three to six having abundant, very short, black pile; metasomal sterna two to four with narrow fringes of pale grey pile, pile longest laterally.

Antennae long, deep brown to black, flagellar segments one and one-half times as long as broad; malar space five-eighths as long as broad; clypeus densely punctate with shallow punctures, punctures rather obscure with linear interspaces; vertex densely punctate, dull. Prothoracic spines absent; mesoscutum densely punctate over anterior and lateral surfaces, punctures one-half to one puncture width apart, interspaces shiny, impunctate area virtually absent; scutellum very densely and finely punctate over posterior three-quarters of surface, punctures one-half puncture width apart to contiguous on lateral and posterior margins, becoming one to one and one-half puncture widths apart on disc, extreme anterior face shiny, impunctate; mesepisterna dull, very shallowly, obscurely, longitudinally striately punctate, interspaces dull; propodeum with basal area with deep, quadrate pits, lateral and posterior faces dull and rugose, posterior face particularly laterally rugose on median area; tegulae brownish hyaline, finely

and rather densely punctate; wings very dusky with abundant, deep fuscous pile over entire surface, nervures dark brown; legs black; posterior basitarsi five times as long as broad. First metasomal tergum finely punctate over entire surface, punctures approximately two to four puncture widths apart laterally, becoming sparser, finer, and shallower on median and anterior faces, punctures most dense on lateral and apical portions; metasomal tergum two with disc uniformly, finely punctate, punctures approximately two puncture widths apart; metasomal sterna shiny, finely and sparsely folliculated; seventh ventral plates with apical portions trilobate, lateral portion broadly joined at base with apical one-half free, as in illustration.

FEMALE: length 14 mm., wing length 11 mm.

Pile of face erect and dense, particularly about antennal bases and along inner orbital margins, strongly tinged with ochreus, especially above; clypeus with a few, overhanging hairs, not at all concealing surface; vertex with pile ochreus, concentrated principally in ocellar triangle; upper genal areas with pile tinged with light ochreus, pile becoming much finer and lighter below; mesoscutum densely covered with abundant, erect, ochreus pile over entire surface; scutellum with a very broad, dense band of deep ochreus pile about lateral and posterior margins; mesepisterna with pile long, fine, pale grey to white; propodeum with long fringes of dense, pale grey to light

ochreous pile along latero-posterior margins, pile most dense on upper surfaces, lateral and posterior faces with a very sparse covering of erect, pale grey to light ochreous pile; pile of legs long and rather sparse except on posterior tibiae and femora, pile predominantly pale grey to ochreous, however with a very strong admixture of shorter, black pile, particularly on tibiae and basitarsi of all three pairs of legs, proportion of black pile becoming much stronger on posterior legs; first metasomal tergum with a very weak fringe of pubescence on extreme apico-lateral margins, lateral fringes of pile weak, tinged with light ochreous, and barely reaching apical fascia, disc with a sparse covering of short, erect, pale grey pile; metasomal terga four and five with discs having a sparse covering of long, erect, black hairs, hairs becoming light laterally; metasomal sterna with very fine, weak fringes of pale grey pile on spaces of segments two to four, discal areas of these terga with a few erect hairs, not at all scopa-like.

Antennae deep brown to black, flagellar segments one and one-eighth times as long as broad; malar space one-half as long as broad, slightly broader toward posterior mandibular articulation; clypeus convex, densely and shallowly striately punctate, interspaces dull; vertex finely and densely punctate, interspaces shiny; fascial foveae greatly broadened above, dorsal edges strongly depressed and rounded, extending three-quarters of way from inner orbital margins to lateral ocelli. Prothoracic

spines vestigial; mesoscutum very densely punctate, punctures almost contiguous on anterior one-half and lateral margins, impunctate area virtually absent; scutellum densely punctate over posterior three-fourths, punctures becoming coarser with linear shiny interspaces on median discal area, anterior one-quarter shiny, impunctate; mesepisterna dull, densely and shallowly punctate with interspaces dull and roughened, punctures becoming exceedingly obscure below; propodeum with basal area deeply, quadrately pitted, lateral and posterior faces irregularly rugose; tegulae brownish hyaline, finely and rather densely punctate; wings dusky with abundant, deep fuscous pubescence, nervures brown to dark brown; legs black; posterior basitarsi 3.6 times as long as broad, basitarsi with upper face longitudinally excavated, posterior tibiae with upper posterior faces having a very shallow, longitudinal groove. First metasomal tergum shiny, very finely and sparsely punctate, punctures most dense and finest along apical margins, discal area with punctures three to four puncture widths apart; second metasomal tergum shiny, rather densely folliculated with broad, shiny interspaces; metasomal sterna shiny, coarsely and densely folliculated.

Distribution:

Massachusetts: Woodshole.

New York: Van Courtland Park; Long Island.

New Jersey: Avalon; Rahaway; Clementon; Westville; Elmer;

Bridgeton; Cresskill; Ft. Dix; Angelsea; Ocean City.

Maryland: Plummers Island; Bethesda; Baltimore.

District of Columbia: Washington.

Virginia: Dismal Swamp; Lake Drummond; Falls Church;
Chain Bridge.

North Carolina: Ivanhoe; Atkinson; Beaufort; Jacksonville;
Lake Waccamaw; Black Mountains; Morehead; Washington;
Magnolia; Raleigh; New River.

South Carolina: Dewees Island; Charleston.

Georgia: Atlanta.

Florida: Orange County; St. Augustine; Orlando.

Alabama:

Louisiana: Brednox.

Texas: Fedor; Colorado County; Tombstone; Trinity; Rockdale;
Lexington; Willis.

Oklahoma: Caney.

Flight Records:

This is a vernal species, having been recorded from March 13 and June 20, occurring in greatest abundance during March, April, and May.

Plant Records:

Aronia, Ilex, Salix, Vaccinium.

The holotype is located in the British Museum (Natural History), London, England.

Colletes validus Cresson

validus CRESSON, 1868, Proc. Boston Soc. Nat. Hist., vol. 12, p. 165; CRESSON, 1872, Trans. Amer. Ent. Soc., vol. 4, p. 248 (questionable); PATTON, 1879, Proc. Boston Soc. Nat. Hist., vol. 20, p. 142; COCKERELL, 1905, Psyche, vol. 12, p. 85; BRITTON and VIERECK, 1906, Rept. Connecticut Agric. Exper. Sta., pt. 4, p. 210; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 34; SMITH, 1910, Ann. Rept. New Jersey State Mus. for 1909, p. 695; VIERECK, 1916, Connecticut Geol. Nat. Hist. Survey Bull., no. 22, p. 740; CRESSON, 1916, Mem. Amer. Ent. Soc., vol. 1, p. 109; LEONARD, 1926, Cornell Univ. Agric. Exper. Sta. Mem., no. 101, p. 1021; PEARSON, 1933, Ecolog. Monog., vol. 3, p. 384; BRIMLEY, 1942, Sppl. Insects of North Carolina, p. 36.

This is close relative of C. inaequalis, occurring in abundance in the Atlantic seaboard states during spring and early summer. It is readily distinguished by its large size and exceedingly long malar space, one and three-quarters times as long as wide in the male, and one and one-quarter times as long as wide in the female. Cresson records the species from Dallas County, Texas, and Pearson (1933) lists it as occurring in Illinois. Both of these localities are out of the expected range of the species, and I have not as yet seen material west of the Carolinas. There is some variation in the size of the species, the males ranging from 10.5 to 12.5 mm. and the females from 11.5 to 15 mm.

MALE: length 12 mm., wing length 10 mm.

Pile of face very long, dense, and dusky over clypeus and antennal basal regions; vertex with pile long and rather dense, a few dark hairs intermixed; genal areas with pile long, tinged with pale grey to light ochreus, pile becoming much longer and finer below, maintaining light yellowish tinge; mesoscutum with abundant, long, erect pile, pile predominantly pale grey to tinged with ochreus but having a rather strong admixture of fine, black pile, particularly on median discal area; scutellum with a dense fringe of light ochreus pile about lateral and posterior margins, discal area having an admixture of light ochreus and black hairs; mesepisterna with pile long, fine, and pale grey, propodeum with long, dense lateral fringes of light ochreus pile, particularly on upper latero-posterior margins, pile of lateral and posterior faces long, fine, and pale grey; pile of legs long, rather dense, and pale grey; first metasomal tergum with apical fascia narrow, broadly interrupted medially, and white to pale grey, lateral fringes of long, pale grey pile reaching to apical fascia, discal area with abundant, long, erect pile tinged with grey; metasomal terga two to five with fasciae narrow, pale grey, and weak; metasomal terga four to six with discs having a sparse covering of long, erect, black pile; metasomal sterna two to five with weak apical fringes of pale grey pile, pile much longer laterally.

Antennae long, deep reddish brown, flagellar segments

one and one-half times as long as broad; malar space exceedingly long, one and three-quarters times as long as broad, having weak longitudinal striae extending from base of eye to the mandibular articulation; clypeus very long, densely punctate over basal three-quarters, apex and apico-lateral faces shiny and sparsely, weakly striately punctate; vertex dull, very densely and finely punctate, compound eyes weakly petiolate. Mesoscutum very densely and coarsely punctate over entire surface, punctures contiguous to one-half puncture width apart on antero-lateral surfaces, becoming sparser medially; scutellum with lateral and posterior margins densely, closely, contiguously punctate, punctures becoming more distinct on median discal area, surface dull; mesepisterna dull, very shallowly and densely punctate, punctures becoming obscure below; propodeum with basal area very narrow, shallowly, quadrately pitted and abruptly sloping ventrally, lateral and posterior faces dull and roughened; tegulae deep brown; wings very dusky with abundant, deep fulvous pubescence, nervures brown; legs deep brown to black; posterior basitarsi four and one-quarter times as long as broad. First metasomal tergum finely and densely punctate, punctures one-half to one puncture width apart, interspaces shiny; second metasomal tergum rather coarsely and densely folliculated, with shiny interspaces, follicles one to one and a half follicle widths apart; metasomal sterna shiny, finely and sparsely folliculated; seventh ventral plates much as in thoracicus,

however with trilobate apical portions broadly separated.

FEMALE: length 13 mm., wing length 10 mm.

Pile of face dense, erect, and pale grey about antennal bases and along lower inner orbital margins, abundant, erect, black pile intermixed below antennal bases with a few black hairs on basal area of the clypeus; vertex with pile predominantly black; upper genal areas with pile long, fine, and pale grey to tinged with ochreus, a few black hairs intermixed on anterior portion, pile of genal areas becoming longer, finer, and whiter below; mesoscutum with pile predominantly pale grey to fulvous, having abundant, black pile on median discal area; scutellum with dense fringes of light ochreus pile about lateral and posterior margins, disc with abundant, coarse, black pile; mesepisterna with pile long, fine, and white; propodeum with dense fringes of long, pale grey pile on latero-posterior margins, most dense on upper portions, lateral and posterior faces with sparse, erect, pale grey pile; first metasomal tergum with apical fascia weak and white, broadly interrupted medially, lateral fringes of long white pile dense, extending to apical fascia, discal area with sparse, erect, fine, pale grey pile; metasomal terga two to four with fasciae broad, weak, and white to grey; metasomal terga three to five with discal area having abundant, erect, black pile; metasomal sterna two to five with a sparse covering of short, fine, pale grey to fulvous pile.

Antennae long, deep brown to black, flagellar segments

one and one-eighth times as long as broad; malar space very long, approximately one and three-eighths times as long as broad; clypeus long with a very shallow, longitudinal median groove, surface rather densely punctate along clypeo-frontal regions and down median longitudinal groove, lateral faces sparsely, weakly striately punctate, broad shiny interspaces, punctures one to three puncture widths apart; vertex dull, very densely and finely punctate; fascial foveae shallow and curved medially from inner orbital margins. Prothoracic spines absent; mesoscutum densely punctate, punctures contiguous on anterior half and lateral faces, impunctate area absent, median discal area rather sparsely covered with coarse punctures; scutellum dull and roughened, very obscurely and shallowly punctate, punctures barely evident on median discal area; mesepisterna dull, roughened, finely, obscurely, and shallowly punctate, punctures not discernible on disc; propodeum with basal area sharply sloping ventrally, shallowly, quadrately pitted, lateral and posterior faces dull and roughened; tegulae deep brownish hyaline, finely punctate; wings dusky with abundant, deep fulvous pubescence, nervures brown to dark brown; legs deep brown to black; posterior basitarsi 3.7 times as long as broad. First metasomal tergum very finely punctate, with shiny interspaces, punctures one and one-half to three puncture widths apart, becoming closer on the apical margins; second metasomal tergum finely and densely folliculated, with very narrow, shiny interspaces;

metasomal sterna shiny, sparsely and finely folliculated on apical half of each sternum.

Distribution:

The species occurs in abundance along the Atlantic seaboard states, having been recorded from New Brunswick, New York, New Hampshire, Michigan, New Jersey, Pennsylvania, Massachusetts, Connecticut, and North Carolina.

Flight Records:

It has been taken between March 6 and July 9.

Plant Records:

Prunus, Vaccinium, v. corymbosum. Swenk records the bee as visiting the flowers of Ribes oxycanthoides, Ribes rubrum, Leucothoe racemosa, and Chamaedaphne calyculata in the wet woods and swampy lands.

The holotype is located in the Academy of Natural Sciences of Philadelphia.

GROUP XI - impunctatus

Colletes impunctatus lacustris Swenk

lacustris SWENK, 1906, Ent. News, vol. 17, p. 258;
SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 39; GIBSON
and CRIDDLE, 1920, Rept. Ent. Soc. Ontario for 1919, p. 20.
vicinalis GRAFNICHER, 1911, Bull. Publ. Mus. Milwaukee,

vol. 1, p. 228; GRAENICHER, 1935, Ann. Ent. Soc. Amer.,
vol. 28, p. 301 (new synonymy).

This species, originally described by Swenk from Michigan, occurs sparingly across the northern boreal zone of America with western records at Fort Nelson, British Columbia, Whitehorse, Y. T., and the Mackenzie River delta. I believe that the form is conspecific with Colletes impunctatus Nylander of the Palearctic region on the basis of the Noskiewicz description and drawings. He states that the species extends from Mongolia to the region of the Alps but not continuously and is disjunct in Europe at least. Whether this is a result of incomplete collection has not as yet been ascertained. His drawings of the seventh ventral plate of the species are taken from specimens originating in the Alps northern Europe (presumably eastern Scandinavia) and eastern Siberia and display distinct differences which -- "appear to be constant and suggest the splitting of a species into a number of geographical races." He apparently hesitates in doing so on the basis of insufficient material. The seventh ventral plate of the eastern Siberian specimen agrees closely with material from the Yukon and the district of Mackenzie except that the apical projection is about one-fifth again as long as the Noskiewicz illustration. His description agrees closely with the Nearctic material. Graenicher's type of C. vicinalis taken from Wisconsin is identical with the typical females

of lacustris.

MALE: length 8 mm., wing length 6.75 mm.

Pile of face pale grey long, especially about antennal bases and overhanging basal portion of clypeus, a few darker hairs along lower inner orbital margins and antennal bases; vertex with pile sparse, dusky, with a few black hairs intermixed, particularly in ocellar triangle; upper genal areas with pile short, sparse, and pale grey with a few darker hairs on anterior margins, pile becoming much longer and finer below, dusky; mesoscutum with pile very long, rather sparse, and dusky to tinged with light ochreous, a few darker hairs, not black, intermixed on the median discal area; scutellum with a very sparse covering of long, erect, dusky pile, with a weak admixture of black hair, black pile very long and fine; mesepisterna with pile long, fine, and dusky; legs with pile sparse, long, and pale grey; propodeum with rather dense fringes of dusky to dark pile on dorsal latero-posterior margins, lateral faces with a few, erect, dusky hairs, posterior face with abundant, erect pile; first metasomal tergum with a very weak apical fascia, evident only on extreme lateral faces as narrow margins of white pile, lateral fringes of dusky pile very weak, not reaching to apical fascia, disc with abundant, erect, fuscous pile; metasomal terga two to five with fasciae narrow, weak, and white to pale grey, often broadly interrupted medially; metasomal terga three to five with discs having abundant, erect, deep fuscous to black pile;

metasomal sterna bare.

Antennae long, reddish brown to black above, flagellar segments one and one-quarter times as long as broad; malar space as long as broad; clypeus long and convex with a very shallow, longitudinal median sulcus, surface finely and densely punctate, particularly about clypeo-frontal margins and over basal two-thirds, fine puncturation extending down median longitudinal sulcus to apex, latero-apical surfaces shiny, impunctate; vertex dull, densely and finely punctate. Prothoracic spines very short and sharp; meso-scutum finely punctate, punctures one-half to one puncture width apart on anterior one-half and extreme lateral margins, punctures becoming much sparser toward large median impunctate area; scutellum roughened to contiguously punctate on extreme peripheral margins, punctures becoming more distinct and fine on median discal area where they are approximately one puncture width apart, anterior one-third shiny, impunctate; mesepisterna shallowly, obscurely punctate, giving surface a more roughened appearance, punctures almost completely obscure below; propodeum with basal area very narrow and shallowly, obscurely, quadrately pitted, lateral and posterior faces dull and roughened; tegulae deep brown to black; wings dusky with abundant, deep fulvous pubescence over entire surface, nervures brown; legs deep brown; posterior basitarsi four times as long as broad. First metasomal tergum shiny, sparsely and finely punctate with punctures two to four puncture widths apart, becoming much

finer and even sparser medially; second metasomal tergum irregularly folliculated with moderately coarse punctures, much smaller than punctures of first metasomal tergum, interspaces shiny, apical fascial depressions lighter brownish hyaline and impunctate; metasomal sterna shiny, rather finely and sparsely punctate, follicles most dense on apical one-half of each sternum, metasomal sterna two and three with apical margins sharply emarginate medially; seventh ventral plates with an enlarged basal discal area, medio-apical margins extended faintly, apico-medial processes hyaline non-pubescent except for an apical fringe of a few, short, fuscous hairs (See fig. 58).

FEMALE: length 9.5 mm., wing length 6.75 mm.

Pile of face rather sparse, erect, and most dense about antennal bases, becoming more strongly tinged with fulvous below; vertex with pile predominantly black, particularly in ocellar triangle; upper genal areas with pile light fulvous with an admixture of black pile on anterior faces, pile becoming longer, finer, and sparser below; mesoscutum with pile tinged with ochreous to fulvous, particularly on anterior and lateral margins, a strong admixture of black pile on median discal area; scutellum with a narrow peripheral fringe of fulvous pile, disc with abundant, long, erect, black pile; mesepisterna with pile long, fine, and pale grey, propodeum with long fringes of light fulvous pile on dorsal latero-posterior margins, extending down latero-posterior margin toward pedicle, lateral and posterior faces

with a few, erect, pale grey hairs; pile of legs long, moderately dense, and tinged with fulvous; first metasomal tergum with apical fascia evident only on extreme lateral margins as very narrow, white bands, broadly interrupted medially; metasomal terga two to five with fasciae broader, weak, and white, often interrupted medially; metasomal terga four and five with abundant, short, black, erect pile on discs; metasomal sterna bare except for a few apical hairs to each sternum.

Antennae long, reddish brown, flagellar segments as long as broad; malar space three-quarters as long as broad; clypeus convex and long, shallowly and rather densely punctate on extreme latero-frontal regions and down a median longitudinal line, interspaces shiny, lateral and latero-apical faces shiny, sparsely punctate with very shallow punctures; vertex finely and variably punctate, punctures one to three puncture widths apart, interspaces shiny, fascial foveae not at all distinct, very narrow. Prothoracic spines vestigial; mesoscutum shallowly, densely punctate over anterior and lateral margins, interspaces shiny, impunctate area large; scutellum closely, obscurely punctate over posterior and lateral margins, punctures becoming sparser on median discal area, approximately one-half to one puncture width apart, anterior one-third shiny, impunctate, scutellum with a very weak, longitudinal median groove extending to anterior margins; mesepisterna shallowly, finely, obscurely punctate, surface dull above,

becoming much more shiny below where punctures are sparser; propodeum with basal area narrow, very shallowly, obscurely, quadrately pitted, lateral and posterior faces dull and roughened; legs deep reddish brown; posterior basitarsi three and three-quarters times as long as broad. First metasomal tergum shiny, very finely punctured to folliculated, virtually impunctate over a broad median discal area; second metasomal tergum very finely and sparsely folliculated, shiny; metasomal sterna shiny, sparsely and finely folliculated.

Distribution:

New Brunswick: Dalhousie.

Quebec: Forestville; Hull.

Ontario: Ottawa; Toronto; Sudbury; Haileybury.

Maine: Capens; Mount Katahdin.

New Hampshire: Randolph.

Michigan: Baraga County; Douglas Lake; Pine Lake, Marquette County.

Wisconsin: Solon Springs; Douglas County.

Minnesota: St. Anthony Park.

North Dakota: Mott.

Alberta: Banff.

British Columbia: Summerland; Inverness; Fort Nelson.

Northwest Territories: Cameron Bay; Great Bear Lake; Reindeer Depot, Mackenzie Delta.

Yukon Territories: Whitehorse.

Flight Records:

The species has been recorded as flying between June 11 and July 24.

Plant Records:

There are no records of flowers visited on the specimens in my possession. However, Swenk records the type series as being collected in the huckleberry barrens and in meadows and marshy tracts, stating that it quite probably visits the huckleberry blossoms.

The holotype is located in the collection of the University of Nebraska.

GROUP XII - willistoni

Colletes willistoni Robertson

willistoni ROBERTSON, 1891, Trans. Amer. Ent. Soc., vol. 18, p. 60; ROBERTSON, 1895, Trans. Amer. Ent. Soc., vol. 22, p. 116; ROBERTSON, 1904, Canadian Ent., vol. 36, p. 275; PIERCE, 1904, Univ. Nebraska Studies, vol. 4, p. 24 (believed to be latitarsis); ROBERTSON, 1906, Science, vol. 23, p. 309; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 15; RAU, 1922, Trans. Acad. Sci. St. Louis, vol. 24, p. 37; CRIDDLE et al, 1924, Rept. Ent. Soc. Ontario, vol. 33, p. 99; ROBERTSON, 1926, Psyche, vol. 33, p. 116; ROBERTSON, 1926, Ecology, vol. 7, p. 378; ROBERTSON, 1928, Flowers and Insects, p. 10; PEARSON, 1933, Ecolog. Monog. vol. 3, p. 384; BRIMLEY, 1942, Suppl. Insects of North Carolina p. 36; TIMBLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 399.

The species is closely related to brevicornis but differs from it in not having the sharp preapical grooves nor the raised phlange-like margins on the first three metasomal terga. The first and second metasomal terga are strongly punctate to the apices and apical fasciae are weak. The females of the species are likely to be confused with latitarsis, but differ in having the second metasomal

tergum punctate to the apex, rather than with the smooth shiny apical margin of latitarsis. The second tarsal segment of the hind leg is one and one-half times as long as broad in willistoni, whereas in latitarsis the second segment is quite short, about as long as broad.

MALE: length 9 mm., wing length 6 mm.

Face with hair white, clumped about antennal bases and along inner orbital margins, clypeus bare; vertex with pile pale grey; genal areas with white pile becoming longer toward lower faces; mesoscutum with mixture of black and white pile with white predominating on anterior half; scutellum with black and white pile, discal area almost completely covered with black hair, while lateral and posterior margins rimmed with long, plumose, white pile; mesepisterna with long, white plumose pile, not concealing surface; propodeum with dense dorso-lateral clumps of long white pile; legs with pile short and pure white; metasomal terga one to five with white fasciae weakest on first and second; first metasomal tergum with dense lateral fringes of long white pile extending to apical fascia, discal area with a few long, white, erect hairs, not concealing surface; metasomal terga two to five with discs having abundant short black pile; metasomal sterna with apical fasciae of very long, sparse, white pile, directed posteriorly, weakest at mid line.

Antennae reddish brown, flagellar segments seven-eighths as long as broad; malar space one-half as long as wide; clypeus flattened, dull, with evidence of few shallow, longitudinal punctures; vertex dull, weakly roughened, not distinctly punctate. Prothoracic spines blunt, weakly triangular; mesoscutum coarsely and densely punctate with punctures no more than one-half puncture width apart over entire surface; scutellum coarsely, densely, rugosely punctate over entire surface with punctures contiguous with no shiny interspaces; mesepisterna coarsely and densely punctate, punctures almost contiguous leaving linear interspaces; propodeum with lateral and posterior faces weakly rugose, shiny; tegulae light brown, nervures light brown; wings dusky, with abundant short brown pubescence, most dense at apex; legs reddish brown; posterior basitarsi three and one-half times as long as broad. First and second metasomal terga densely punctate with punctures varying from one to two puncture widths apart, punctures most dense on median apical line, terga punctate to extreme apex; second metasomal tergum broadly depressed basally; metasomal terga three to five with discs folliculated; metasomal sterna having discs shiny with a few fine scattered punctures.

FEMALE: length 10.5 mm., wing length 6 mm.

Face with hair sparse, erect, and white about antennal bases and along inner orbital margins, clypeus bare; vertex

with pile pale grey to light ochreus; genal areas with pile short, erect, and pure white, slightly longer below; mesoscutum with strong admixture of black and white pile, black predominating on discal regions with white most dense on anterior and lateral faces; scutellum with discal area covered with long black hairs, a shorter finer fringe of white pile evident laterally and posteriorly; mesepisterna with short, white, erect pile; propodeum with dorso-lateral margins having dense clumps of long white pile; legs with pile light ochreus, a few dark hairs on upper surface of posterior tibiae; metasomal terga one to four with fasciae broad and pure white; metasomal tergum five with fascia much reduced, evident only as a weak rim; first metasomal tergum with distinct lateral fringes of pure white pile extending to apical fascia, anterior face and anterior half of discal area covered with abundant short, erect, white pile, not at all concealing surface; metasomal terga two to five with abundant short, fine, black pile; metasomal tergum six with pile deep ochreus to golden brown; metasomal sterna with dense clump of erect, light ochreus pile on second and third metasomal sterna acting as a weak scopa, fasciae absent except for a row of long white pile.

Antennae reddish brown, flagellar segments five-eighths as long as broad; malar space one-third as long as wide; clypeus flattened, very weakly concave medially and dull, with evidence of few longitudinal shallow punctures;

vertex shiny with a few scattered shallow punctures. Prothoracic spines short, triangular; mesoscutum densely punctate with coarse punctures, punctures almost contiguous on anterior and lateral faces, becoming sparser posteriorly, interspaces shiny; mesoscutum with extreme anterior face sparingly punctate, punctures becoming very deep and dense laterally and posteriorly where they are contiguous; mesepisterna rough and rugosely punctate with deep contiguous punctures on upper face, punctures becoming sparser below; propodeum with lateral and posterior faces dull and weakly roughened; tegulae light brown, nervures dark brown; wings dusky with abundant short, dark brown pubescence over entire surface; legs deep brown; posterior basitarsi two and three-quarters times as long as broad. Metasomal terga one and two distinctly punctate with punctures varying from one to two puncture widths apart, punctures most dense and distinct on extreme apical portion of the respective segments, punctures extending to extreme apical margins on terga one and two; metasomal tergum two with broad basal depression; metasomal terga three to five densely folliculated; metasomal sterna with discs finely and densely folliculated, dull.

Distribution:

The species is broadly distributed over eastern America extending west of the Continental Divide into Utah. Marginal localities include: Raleigh, North Carolina; Bethesda, Maryland; Pt. Pelee, Ontario; Aweme, Manitoba;

Washington, Delta, and Smithfield, Utah; Garden City, Kansas; Fedor and Pittsburg, Texas; Carlinville and Odin, Illinois.

Flight Records:

The species has been recorded as flying between May 9 and September 24 with the peak of the population occurring in late June and July.

Plant Records:

Melilotus, Monarda punctata occidentalis, Physalis lanceolata, P. virginiana, Psoralea tenuiflora.

The holotypes are located in the Illinois State Natural History Survey Collection

Colletes brevicornis Robertson

brevicornis ROBERTSON, 1897, Trans. Acad. Sci. St. Louis, vol. 7, p. 315; ROBERTSON, 1900, Trans. Acad. Sci. St. Louis, vol. 10, p. 51; ROBERTSON, 1904, Canadian Ent., vol. 36, p. 275; ROBERTSON, 1906, Science, vol. 23, p. 309; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 12; GRAENICHER, 1910, Bull. Pub. Mus. Milwaukee, vol. 1, p. 228; SMITH, 1910, Ann. Rept. New Jersey State Mus. for 1909, p. 695; GIBSON AND CRIDDLE, 1920, Rept. Ent. Soc. Ontario, vol. 36, p. 131; ROBERTSON, 1926, Ecology, vol. 7, p. 378; ROBERTSON, 1926, Psyche, vol. 33, p. 116; ROBERTSON, 1928, Flowers and Insects, p. 10; BRIMLEY, 1938, Insects of North

Carolina, p. 451.

opuntiae COCKERELL, 1906, Ann. Mag. Nat. Hist., ser. 7, vol. 17, p. 312; COCKERELL, 1907, Univ. Colorado Studies, vol. 4, p. 240; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 12.

This and C. willistoni are two closely related species of the consors group, differing primarily in the presence of a flange-like apical margin on metasomal terga one, two, and three in both sexes of brevicornis. The antennae of the male are short with the segments scarcely as long as broad. In the typical series from Illinois, the raised flange-like apical portion is present on the first three abdominal segments; the flange and the deep pre-apical grooves are more abrupt in specimens taken from Colorado and over the northern states to the eastern seaboard, but on specimens taken from Louisiana and southern Texas the margins and the grooves, particularly on the third metasomal tergum, are reduced. Accompanying this feature there appears to be a reduction or loss of the groove on the medial portion of the first metasomal tergum but it remains quite evident on the lateral margins. In all specimens examined, the preapical groove on the second metasomal tergum is distinct.

MALE: length 9.5 to 10 mm., wing length 7 mm.

Face with pile long and pure white, most densely clumped about antennal margins and about upper margins of

clypeus; vertex with pile white to pale grey, pile becoming longer and sparser on lower portion of genal areas; mesoscutum with abundant, long, white pile, strongly intermixed with black hairs especially on posterior medial area of mesoscutum; scutellum with strong admixture of black pile about lateral and posterior margins; mesepisterna with pile light, long, and weakly plumose, tending to slightly grey above; propodeum with long fringes of pale grey pile on latero-posterior margins, longest and most dense dorsally, lateral and posterior faces with abundant, erect, pale grey pile; legs with pile white and short; metasomal terga one to three with weak epical fasciae of pure white pubescence most evident on extreme lateral faces; metasomal terga four and five with metasomal terga broad and pure white; metasomal terga one to six with discs having sparse, short, white pile, not concealing surface; metasomal sterna two to five with narrow, uniform apical fasciae of pure white pile.

Antennae reddish brown, flagellar segments barely as long as wide, first flagellar segment one and one-quarter times as long as second; malar space linear at anterior mandibular articulation to one-quarter as long as wide at posterior mandibular articulation; clypeus weakly convex, densely and deeply punctate with very narrow, shiny interspaces; supra-antennal area shiny with very deep, close punctures, approximately one puncture width apart; vertex with punctures

shallower and sparser than face, with shiny interspaces. Prothoracic spines vestigial; mesoscutum shiny, densely and coarsely punctate, punctures approximately one-half puncture width apart on anterior half, becoming sparser on posterior medial area, impunctate area absent; scutellum shiny and sparsely punctate over anterior one-third, punctures becoming deeper, denser, and almost contiguous towards posterior margin; mesepisterna coarsely, deeply, and closely punctate, punctures no more than one-half puncture width apart; metapleura with upper surface extended to form a weak protuberance as is common to the americanus group, however rims do not extend posteriorly directly but curve ventrally, ending well along metapleural propodeal suture; propodeum with basal area sloping sharply ventrally, irregularly, quadrately pitted, lateral and posterior faces weakly rugose; tegulae brown; wings dusky covered with short, brown to light ochreous pubescence especially at apex, nervures light brown; legs black; posterior basitarsi three and one-quarter times as long as broad. Metasomal terga one and two deeply and coarsely punctate with shiny interspaces, punctures one to two puncture widths apart medially, becoming much denser laterally where they are no more than one puncture width apart; metasomal terga one to three with deep pre-apical grooves followed by raised flange-like margins; metasomal terga two and three depressed basally; metasomal sterna with apical margins entire; discs shiny, finely and densely

folliculated; seventh ventral plates elongate quadrate, emarginate near bases of lateral margins, dense clumps of pile on baso-medial portions of plates, apices membranous hyaline.

FEMALE: length 10 mm., wing length 7 mm.

Face with white pile of variable length about antennal bases and along inner orbital margins, pile sparse and not concealing surface; clypeus with sparse covering of semi-erect, white pile, not concealing surface; vertex with pile tinged with ochreus; genal areas with pile white, becoming longer and white on lower face; mesoscutum with mixture of short, white and black pile; scutellum with strong covering of black pile, particularly about lateral and posterior margins, a very weak, laterally directed fringe of white pile on extreme lateral margins; mesepisterna with sparse covering of long, fine, white pile; propodeum with weak latero-posterior fringes of white pile extending down toward pedicle, posterior face with short, sparse, pale grey pile; anterior two pairs of legs with pile short and white, posterior femora and tibiae with pile tinged with ochreus; metasomal terga one and two with weak, white apical fasciae, at times only observable on extreme lateral margins; metasomal terga three to five with a broad, dense apical fascia of pure white pile; metasomal terga one to five with discs having short, sparse, white pubescence, not concealing surface; metasomal tergum six with semi-appressed, golden to pale grey pile; metasomal sterna

two to five with median circular patch of scopa-like, ochreous pile; apical margins of metasomal sternum five with a fringe of ochreous pile.

Antennae reddish brown, flagellar segments short, about five-eighths as long as broad, basal flagellar segment one and three-quarters times as long as second; malar space linear; clypeus strongly convex, deeply and closely punctate with very narrow interspaces; supra-antennal area deeply and coarsely punctate, becoming shallower and sparser at vertex, interspaces shiny; vertex coarsely punctate with shiny interspaces; fascial foveae deep, broadened slightly median, extending slightly above inner orbital margins, dorsal margins extending three-eighths of the distance to lateral ocelli. Prothoracic spines vestigial or triangular; mesoscutum closely, coarsely, and densely punctate over entire surface with punctures no more than one-half puncture width apart; scutellum with anterior margin shiny, impunctate, punctures coarser and denser towards posterior margin where they are almost contiguous; mesepisterna shallowly but densely punctate with punctures no more than one-half puncture width apart; metapleura with upper portion having protuberance similar to that of americanus group, but with posterior part of rim extending ventrally down the metapleural-propodeal suture; propodeum with basal area sloping sharply ventrally, shallowly, quadrately pitted, lateral and posterior faces dull, roughened; tagulae deep brown; wings with abundant, short, brown pubescence

at apex, becoming sparse to unobservable basally, nervures brown; legs black, tarsi brown; hind basitarsi 3.2 times as long as broad. Metasomal terga one and two coarsely and densely punctate with punctures not more than one puncture width apart and usually much less; metasomal terga one and two with distinct pre-apical groove followed by raised flange-like apical margins; metasomal tergum three with broader, weakly depressed pre-apical groove and having flange-like margin raised but slightly; metasomal terga four and five uniform; metasomal sterna dull, and finely and densely folliculated over the apical three-quarters; apical metasomal sternum with apical half depressed and almost hyaline with basal arcuate band of overhanging pile.

Distribution:

The species originally described by Robertson from Carlinville, Illinois, occurs over most of the area east of the Rocky Mountains but nowhere in abundance.

Wisconsin: Two Rivers; Walworth County; St. Croix County;
Cranmoor.

Michigan: Midland County.

Indiana: Elkhart; Vincennes.

New Jersey: Woodbury.

West Virginia: North River Mills.

North Carolina: Bryson City; Hookers Island; Raleigh;
Kingsboro.

Georgia: Wadley; Atlanta.

Louisiana: (only state record).

Tennessee: Great Smokies National Monument

Arkansas: Boles.

Texas: 9 miles south Lexington; Sweet Home; Calvert; Dallas;
Victoria; Gainsville; Fedor; Jackson County.

Oklahoma: Vinita; Ardmore.

Kansas: Montgomery County.

Colorado: Boulder; Poudre River, Mishawauka.

Nebraska: Warbonnet Canyon; Carns.

Wyoming: Yellowstone National Park; Rock River.

Montana: Glendive.

Minnesota: Warren.

Manitoba: Aweme.

Flight Records:

The species flies throughout the spring and early summer, occurring later in the more northerly latitudes and higher altitudes. Records from Texas and Georgia show the species as occurring from March 25 to June, while to the north and along the foothills of the Great Divide it has been taken from May until August 14.

Plant Records:

Asclepias, Callirhoe involucrata, C. leiocarps,
Campanula, Melilotus alba, Opuntia. Robertson reports the species to be an oligotropic visitor of Specularia perfoliata in Illinois, but this statement appears to be the result of

incomplete collection data.

The holotypes are located in the Illinois State Natural History Survey Collection.

GROUP XIII - consors

Colletes consors Cresson

This is the largest and most robust species of the entire group, occurring sparingly across eastern North America and in abundance in the mountains from Colorado across the northern edge of the Great Basin into California.

The seventh ventral plates of the species are distinctive, being roughly quadrate with the apical margins broadly rounded, the surface is almost completely covered with long, laterally sloping pile.

MALE: length 9 to 11 mm., wing length 6.5 to 7.5 mm.

Pile of face sparse, erect, and white on median antennal area and clypeus; vertex with pile white to light grey, concentrated principally in ocellar triangle; mesoscutum with pile long, fine, and sparse, light grey or tinged with ochreous, not at all concealing surface; scutellum with pile long, fine, and light grey or dusky, principally about lateral and posterior edges, however with a weak covering extending over median discal area; mesepisterna with pile very long, fine, and light grey; propodeum with latero-posterior

margins having abundant, long, dense, erect, light grey to dusky pile, lateral and posterior faces with pile much sparser and shorter; first metasomal tergum with apical fascia weak and white to light grey, lateral fringes of white to light grey pile strong and extending to apical fascia; metasomal terga one and two with abundant, erect, long, fine, white or light grey pile over discal areas, very slightly obscuring surfaces; metasomal terga two to five with fasciae broad, weak, and white to grey; metasomal terga three to six with discs having abundant, long, erect, black pile.

Antennae deep brown to black, flagellar segments slightly longer than broad; malar space one-half as long as broad; clypeus weakly convex, rather densely and finely punctate about fronto-clypeal regions and basal one-half of clypeus, punctures becoming slightly sparser, coarser apically, separated by shiny interspaces, latero-apical and apical margins with punctures tending to be somewhat striate with shiny interspaces. Prothoracic spines short and sharp; mesoscutum finely punctate with broad, shiny interspaces, punctures one to two puncture widths apart, impunctate area small; scutellum densely, contiguously punctate about extreme lateral and posterior margins, disc finely and sparsely punctate, punctures about one puncture width apart, a deep median longitudinal sulcus extending to anterior margin;

mesepisterna shallowly punctate with shiny interspaces, punctures one-half to one puncture width apart, becoming much finer and sparser on posterior faces; tegulae deep brownish hyaline; wings dusky with abundant, deep fulvous pubescence over entire surface, nervures dark brown; legs deep reddish brown to black; posterior basitarsi three to three and one-quarter times as long as broad. First metasomal tergum very finely punctate with shiny interspaces; sixth metasomal sternum with apical margin convex medially with truncated shoulders laterally; seventh ventral plates roughly quadrate and small, with apical margins broadly rounded, surface almost completely covered with long, laterally sloping pile.

FEMALE: length 10-12 mm., wing length 7-7.5 mm.

Pile of face, vertex and genal areas erect, long, and not concealing surface; mesoscutum with pile long, fine, and dense, tinged with light ochreus; scutellum with a broad band of light ochreus pile about lateral and posterior margins; mesepisterna with pile long, fine, and dense; propodeum with pile longest and most dense on upper latero-posterior margins, lateral and posterior faces with a few, erect, light grey hairs; metasomal terga one and two with apical fasciae present, at times evident only as narrow patches on extreme lateral faces, discs with abundant, erect, light grey to dusky pile; metasomal terga three to six with discs having abundant, long, erect, black pile; metasomal sterna two and three with

abundant, erect, fuscous to black pile on discs, forming a weak scopa, pile becoming much sparser on apical metasomal sterna.

Antennae brown to black, flagellar segments short, about seven-eighths as long as broad; malar space one-third as long as broad; clypeus weakly convex, coarsely striately punctate with shiny interspaces, punctures one to two puncture widths apart; vertex shiny, sparsely punctate, fascial foviae very broad and deep, extending above inner orbital margins two-thirds of the way to lateral ocelli. Prothoracic spines roughly triangular; mesoscutum finely and densely punctate about anterior and lateral margins, punctures about one puncture width apart, impunctate area small; scutellum densely and contiguously punctate about extreme lateral and posterior margins, punctures more distinct on median discal area where they are about one puncture width apart, anterior one-third shiny, sparsely punctate; mesepisterna finely punctate with shiny interspaces, punctures about one puncture width apart, coarser above and much finer below; propodeum with basal area sharply sloping ventrally, not quadrately pitted but with a few, irregular, longitudinal rugae, lateral and posterior faces dull and roughened, latero-posterior margins broadly rounded; tegulae deep brown hyaline, almost black; wings dusky, very densely covered with deep fulvous pubescence over entire surface, nervures dark brown; legs brown to black; posterior basitarsi broad,

2.6 to 3 times as long as broad. First metasomal tergum shiny virtually impunctate, finely and sparsely folliculated; metasomal tergum much as first; metasomal sterna dull, very densely and coarsely folliculated, last metasomal sternum with apical one-half sharply depressed and light brownish hyaline with a basal arcuate band of overhanging, deep brown to black pile.

The species is divided into three subspecies as indicated below.

Colletes consors consors Cresson

consors CRESSON, 1868, Proc. Boston Soc. Nat. Hist., vol. 12, p. 168; CRESSON, 1872, Trans. Amer. Ent. Soc., vol. 4, p. 249 (questionable); UHLER, 1877, Bull. U. S. Geol. Survey Territ., vol. 3, p. 785; COCKERELL, 1899, Catálogo de las Abejas México, Secretaría de Fomento, p. 4 (questionable); COCKERELL, 1905, Psyche, vol. 12, p. 87; SNOW, 1906, Trans. Kansas Acad. Sci., vol. 20, p. 136; CRESSON, 1916, Mem. Amer. Ent. Soc., vol. 1, p. 107; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 387; TIMBERLAKE, 1951, Wassman J. Biol. vol. 9, p. 184.

zonatus VIREECK, 1903, Trans. Amer. Ent. Soc., vol. 29, p. 59; COCKERELL, 1905, Psyche, vol. 12, p. 87; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 291; CRESSON, 1928, Mem. Amer. Ent. Soc., vol. 5, p. 66.

An examination of this type of zonatus Viereck, has shown it to be identical with C. consors Cresson.

This subspecies occurs principally in Colorado, Wyoming, and Idaho. The males are characterized by having the legs without or with little dusky or black pile, the tergal fasciae white and complete on the first five terga, as well as abundant white pile on the discs of metasomal terga one and two. In the females the mesepisterna and the legs are covered with long, black, dense pile, the fasciae are only distinguishable laterally on the discs of the first two metasomal terga, and the propodeum is predominantly covered with light pile.

MALE: length 10 mm., wing length 7 mm.

Pile of face, vertex, and genal areas white to light grey; mesepisterna with pile long, fine, and light grey pile of the propodeum principally light grey (usually) with a few darker hairs, not black, intermixed on upper latero-posterior margins; legs, particularly tibiae and basitarsi, (usually) with weak admixture of black pile, especially on upper surfaces; metasomal sterna two to five with rather dense apical fringes of light grey pile.

Vertex distinctly punctate with shiny interspaces, punctures about one puncture width apart; posterior basitarsi two and three-quarters times as long as broad: first metasomal tergum distinctly punctate with shiny interspaces,

punctures approximately one puncture width apart.

FEMALE: length 10 mm., wing length 7 mm.

Pile about antennal bases and inner orbital margins black; vertex with pile consisting of an admixture of black and deep ochreous to deep dusky pile, principally in ocellar region; upper genal area with pile predominantly black or dark, pile becoming longer and finer and remaining deep brown to black on lower genal areas; mesepisterna with pile long, fine, and black; propodeum having upper latero-posterior margin with strong admixture of black pile; pile of legs black, long, and dense.

Distribution:

The species has been recorded as occurring in Texas, Arizona, and Chihuahua. From the material available I must assume the Texas, Arizona, and Chihuahua specimens to be misidentifications, probably for C. p. paniscus.

Colorado: Pinecliffe; Wondervu, Boulder County; 3 miles west Boulder; Estes Park; Garland; Poudre River Canyon; Chimney Gulch; Blackhawk.

Wyoming: Jenny Lake, Grand Teton National Park;
Yellowstone National Park.

Idaho: Kendrick; Willow Flats, Franklin County.

Flight Records:

The species has been recorded as flying between May 21

and July 27.

Plant Records:

Hydrophyllum fendleri, Pentstemon virens, Phacelia leucophylla, Taraxacum.

The holotype is located in the Academy of Natural Science of Philadelphia.

Colletes consors pascoensis Cockerell

pascoensis COCKERELL, 1899, Proc. Acad. Nat. Sci. Philadelphia, vol. 50, p. 51; SWENK, 1904, Canadian Ent., vol. 36, p. 94; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 388.

consors pascoensis, TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 388;

myroni COCKERELL, 1908, Entomo., vol. 41, p. 293; COCKERELL, 1915, Ann. Mag. Nat. Hist., ser. 8, vol. 15, p. 269; COCKERELL, 1928, Univ. Colorado Studies, vol. 16, p. 99; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 387.

Timberlake questions the validity of the subspecies pascoensis because of his belief that a series of c. consors from Colorado would reveal the same variability shown among western specimens. I have found extremely little variation from the Colorado-Wyoming range of c. consors and believe

the subspecies to be valid.

The male of pascoensis differs in having abundant black pile behind the compound eyes, and in having legs with slightly more dark pile. In the female differences are more evident. The lateral faces of propodeum have the pile almost completely black, metasomal terga one and two have the discs with the pile predominantly black and with white fasciae only evident laterally on the first metasomal tergum. Both sexes are usually much larger than the typical consors. A number of specimens, of females in particular, have the pile of the mesoscutum deep ochreous, as is evidenced in Cockerell's description of Colletes myroni. There is a great deal of variation in the pile of the mesoscutum and the scutellum in particular, varying from a dusky grey to a deep ochreous, and in all instances this appears to be a locally variable.

MALE: length 9.5 mm., wing length 6.5 mm.

Pile of inner orbital margins and of scape with more black intermixed than in other subspecies; pile immediately posterior to upper portions of compound eyes predominantly deep brown to black; pile of the legs dark.

Vertex distinctly, coarsely punctate with shiny interspaces, punctures about one puncture width apart; posterior basitarsi approximately three times as long as broad; metasomal sterna without apical fasciae, shiny, and rather densely folliculated.

FEMALE: length 11 mm., wing length 7 mm.

Pile of face, vertex, and genal areas black; mesepisterna with pile long, dense, and black; propodeum with lateral faces and latero-posterior fringe of pile predominantly black; legs with pile black; metasomal terga one and two with apical fasciae absent or evident only on extreme lateral margins as a few dusky hairs; erect pile on discal area of metasomal terga two to five deep brown to black.

Posterior basitarsi broad, approximately two and one-half times as long as broad.

Distribution:

The species ranges from a southern limit of Inyo and Monterey Counties in California northward to Oregon, Washington, into British Columbia and about the northern edge of the Great Basin, occurring sparingly through southern Idaho and northern Utah. Peripheral localities include Mono County and Hastings National Historical Reservation, Monterey County, in California; Penticton and Summerland in British Columbia; and Greene Canyon, Cache County and Timpanogos Peak in Utah, where gradation with the typical consors becomes more apparent.

Flight Records:

The species flies earlier in the southern part of its range (California and Oregon) than elsewhere having been recorded as early as April 6. The latest record is July 29 (Chinook Pass, Washington).

Plant Records:

Phacelia.

The holotype is located in the United States National Museum.

Colletes consors mesocopus Swenk

mesocopus SWENK, 1907, Canadian Ent., vol. 39, p. 364; PROCTER, 1938, Biol. Survey Mount Desert Region, part 6, p. 440, part 8, p. 503; GIBSON and CRIDDLE, 1920, Rpt. Ent. Soc. Ontario, vol. 36, p. 132.

This form was described by Swenk from Waldboro, Maine, and is rather abundant in the Great Lakes area of eastern America. However, several intergrades taken from Minnesota, Wisconsin, Saskatchewan, and Alberta, indicate that the species should rank no more than a valid subspecies of consors. Both sexes, while exhibiting some variation in size, approximate specimens of c. consors from Colorado. The species appears to cross the northern Great Plains area into the region of the Great Lakes of eastern North America. On the basis of the present collections it appears that it is extremely rare in the Great Plains and much more abundant both to the east and the west.

The males differ from consors in having no black pile on the face, the legs with only sparse intermixture of

dark hairs; and in having the mesepisterna more deeply punctate.

In the females there is no black pile on the face or the mesepisterna; the fasciae are present and rather dense on terga one to five, with abundant white pile over the discs of metasomal terga one and two.

In a few specimens taken from the Great Plains there is evidence of varying amounts of black or dark pile behind the compound eyes. There seems to be a general reduction in the length of the pile from the west to the east.

MALE: length 9 mm., wing length 6.5 mm.

Pile of face, mesepisterna, propodeum, and legs all dusky to light grey, not intermixed with black; metasomal terga one to five with fasciae narrow, weak, and white; metasomal sterna two to five with apical fringes of dusky to light grey pile, pile shortest medially.

Clypeus tending to be somewhat more sparsely punctate, particularly on apical and latero-apical margins where punctures may be two to three puncture widths apart; vertex densely and coarsely punctate, rather dull; propodeum with basal area not abruptly sloping ventrally at posterior margin but irregularly and shallowly pitted; mesepisterna very finely punctate, punctures separated by at least one puncture width; first metasomal tergum shiny, impunctate, very sparsely and finely folliculated; metasomal sterna shiny and sparsely folliculated.

FEMALE: length 9.5 mm., wing length 6.5 mm.

Pile of face predominantly white with a few darker hairs on lower inner orbital margins and on lower fronto-clypeal area; area immediately posterior to compound eyes with a few, erect, dark hairs; mesepisterna, propodeum, and legs with pile all light, legs strongly tinged with light ochreus; metasomal terga one to four (sometimes five) with fasciae broad, weak, and white; metasomal sterna with discs having abundant, erect, light ochreus pile with a few darker hairs intermixed on apical segments.

Distribution:

Nova Scotia: King's County.

New Brunswick: Tabusintac.

Quebec: Hemmingford; Kazubazua; Forestville; Montcerf;
Aylmer; Hull; Sully.

Maine: Waldboro.

Massachusetts: Needham.

Michigan: Otsego County; Douglas Lake.

Ontario: Port Sidney; Kearney.

Minnesota: Itasca; Kittson County.

Wisconsin: Door County; Ashland County.

Manitoba: Dauphin; Cormorant Lake.

Saskatchewan: Christopher Lake; Melfort.

Alberta: Waterton.

Northwest Territories: Great Slave Lake, Fort Rae.

Flight Records:

The species has been recorded as flying between June 10 and July 26.

Plant Records:

Kalmia, Rubus.

The holotype is located in the collections of the University of Nebraska.

Colletes paniscus Viereck

The species is most likely to be confused with C. consors but differs in the much smaller size and the much less quadrate seventh ventral plate. From all other closely related species it differs in having dark pile along the inner orbital margins and upper genal areas.

MALE: length 8 to 9 mm., wing length 5 to 5.5 mm.

Pile of face long, ragged, and dusky along median clypeal and subantennal areas, a fringe of black pile of variable width along inner orbital margins; vertex with pile weakly or strongly intermixed with black hair; mesoscutum with pile long, ragged, and dusky to light grey; scutellum with pile long and rather dense, particularly about lateral and posterior margins, light grey to grey; mesepisterna with pile long, fine, and light grey; propodeum

with dense fringes of long, light grey pile on the upper lateroposterior margins, lateral and posterior faces with a sparse covering of long, light grey pile; metasomal terga one and two with discs having abundant, erect, white pile, not at all obscuring surface.

Antennae short, deep brown to black, flagellar segments as long as broad; malar space approximately three-quarters as long as broad; clypeus long, finely and densely punctate about basal one-half, punctures becoming sparser, coarser, and striate toward apex, apical surfaces with shiny interspaces; vertex very densely and coarsely punctate, dull. Prothoracic spines vestigial; mesoscutum finely and irregularly punctate, punctures one-half to two puncture widths apart, impunctate area large; scutellum rather densely, contiguously punctate about extreme latero-posterior faces, becoming coarser and separated by shiny interspaces on median discal area, anterior one-third shiny, impunctate, a longitudinal median sulcus extending to anterior margin; mesepisterna with punctures shallow to obscure, interspaces shiny; propodeum with basal area sloping sharply ventrally, basal area with numerous longitudinal rugae, dull, obscurely and irregularly pitted, lateral and posterior faces dull and roughened, latero-posterior margins broadly rounded; tegulae brown to blackish hyaline; wings dusky with abundant, deep fulvous pubescence, nervures brown; legs black; posterior basitarsi three and three-quarters times as long

as broad. First metasomal tergum shiny, variably punctate; metasomal sterna shiny, finely and sparsely folliculated; seventh ventral plates roughly quadrate, slightly broader than long, apical margin weakly rounded at lateral and median edges, latero-basal margin weakly pointed or protuberant, dense transverse fringes of pile extending down median portion of each disc, pile sparse on either side of this dense median hair band, black.

FEMALE: length 9 to 9.5 mm., wing length 7 to 7.5 mm.

Pile of the body long, fine, and intermixed with black.

Antennae deep brown to brownish black; malar space three-eighths as long as broad; clypeus long, densely, coarsely, somewhat striately punctate about basal one-third and fronto-clypeal margins, punctures rather dense, coarse, and striate along a broad, median longitudinal line reaching to apex, where punctures tend to become much more obscure and much more striate, extreme apex and latero-apical portions with punctures sparse, striate, and with shiny interspaces; vertex with punctures sparse, deep, with shiny interspaces, punctures one to two puncture widths apart. Prothoracic spines short and sharp, approximately as long as width across base; mesoscutum finely and densely punctate on anterior one-half and extreme lateral margins, punctures one-half to one puncture width

apart with shiny interspaces; scutellum densely, contiguously punctate over extreme lateral and posterior margins, punctures becoming sparser and more distinct on median discal area where they are one-half to one and one-half puncture widths apart, extreme anterior margin shiny, impunctate; mesepisterna shallowly and rather sparsely punctate, punctures one to two puncture widths apart with shiny interspaces; propodeum with basal area sloping rather sharply ventrally, obscurely and indistinctly pitted with shallow pits, basal area with a number of weak, longitudinal rugae; tegulae deep brown hyaline; wings dusky with abundant, deep fulvous pubescence, nervures dark brown; legs black; posterior basitarsi three times as long as broad. First metasomal tergum shiny, very finely and sparsely folliculated; second metasomal tergum much as first, with follicles just appreciably more dense; metasomal sterna finely roughened, rather densely and finely folliculated, last metasomal sternum with apical one-half sharply depressed and brownish hyaline with an acute basal band of overhanging brown pile.

This species is divided into three subspecies as follows.

Colletes paniscus paniscus Viereck

paniscus VIERECK, 1903, Trans. Amer. Ent. Soc.,
vol. 39, p. 60; COCKERELL, 1905, Psyche, vol. 12, p. 87;

COCKERELL, 1906, Bull. Amer. Mus. Nat. Hist., vol. 22, p. 425; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 291; CRESSON, 1928, Mem. Amer. Ent. Soc., vol. 5, p. 63; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 387.

grisescens COCKERELL, 1930, Amer. Mus. Nov., no. 397, p. 4; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 387.

promontis VIERECK, 1903, Trans. Amer. Ent. Soc., vol. 29, p. 61; COCKERELL, 1906, Bull. Amer. Mus. Nat. Hist., vol. 22, p. 424; COCKERELL, 1906, Trans. Amer. Ent. Soc.; vol. 32, p. 291; CLEMENTS and LONG, 1923, Carnegie Inst. Washington Publ., no. 336, p. 251; COCKERELL, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 628; CRESSON, 1928, Mem. Amer. Ent. Soc., vol. 5, p. 62; COCKERELL, 1928, Univ. Colorado Studies, vol. 16, p. 99; COCKERELL, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 411; COCKERELL, 1934, Amer. Mus. Nov., no. 697, p. 1; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 387.

pleuralis SWENK, 1906, Ent. News., vol. 17, p. 259 (new synonymy).

An examination of C. pleuralis Swenk has proven it to be identical with the well known p. paniscus Viereck.

Both sexes of this subspecies are smaller and less

robust than the following two subspecies. The male differs in having the pile of the vertex predominantly light grey or tinged with light yellow; the pile of the genal areas is all long, fine, and light grey to tinged with yellow; a few dark hairs intermixed above; the legs have the pile short, sparse, and light grey with no dark hairs intermixed; the fasciae are narrow and pure white on metasomal terga one to five; the metasomal sterna two to four have very weak fringes of light grey pile; the mesepisterna have the punctures slightly sparser and more obscure than the other two subspecies; the tegulae are deep black; the first metasomal tergum is shiny with a rather roughened surface and is very finely and sparsely folliculated.

The female has abundant, pale grey pile to tinged with yellow immediately about the antennal bases, the remaining portions of the face are covered with black, erect pile; the upper genal area has the pile predominantly tawny grey extending about the posterior portions of the genal area to the lower faces, there is a narrow fringe of erect, black pile immediately posterior to each compound eye; the mesoscutum and the scutellum have the pile long, grey to tinged with yellow; mesepisterna with the pile long, fine, and grey; propodeum with the latero-posterior fringes of pile exclusively white; legs with the pile dark or black except on the femora, where it is almost exclusively white on the anterior two pairs of legs and

intermixed with light grey on the posterior pair; the first metasomal tergum with the apical fascia white and narrow, weakly interrupted medially, the lateral fringes of pile long, fine, and light grey to white, the disc with abundant, erect, grey pile; metasomal terga two to five with the fasciae broad, dense, and white; second metasomal tergum with the disc having abundant, erect, white pile; metasomal sterna two to four with very weak fringes of white to grey pile, the discs with abundant, erect, black pile, forming a very weak scopa on sterna two and three; propodeum with the basal area much more distinct than on the remaining two subspecies, dull.

Distribution:

The subspecies occurs from the high plateau areas of Arizona and New Mexico northward into Wyoming and Montana. Peripheral localities include: San Francisco Mountains and White Mountains in Arizona; the Las Vegas Mountains and Beulah, New Mexico; throughout the mountainous portions of Colorado; from Green River and Grand Teton National Park, Wyoming; and Gallatin County, Montana.

Flight Records:

The species has been recorded as flying between June 15 and August 7, being most abundant in late June and July.

Plant Records:

Hoostonia, Iris missouriensis, Mertensia franciscana,

Wrightii.

Timberlake also records the species having been collected on the flowers of Salix.

The holotype is located at the Academy of Natural Sciences of Philadelphia.

Colletes paniscus sculleni Timberlake

paniscus sculleni TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 183.

This subspecies resembles p. mertensiae very closely, differing in minor features of pile color. It may be that p. sculleni is not worthy of a differentiation from the next subspecies but further collections are necessary to substantiate this.

The males differ from p. paniscus in having abundant black pile on the vertex, the upper genal areas, and the anterior genal areas; only on the lower genal areas is the pile pale grey to white. The posterior legs have the pile with a strong admixture black or deep brown except for fringes of light pile on the femora and trochanters, The metasomal terga have no apical fasciae, and the metasomal sterna are likewise non-fasciate. The mesoscutum is closely and rather coarsely punctate over the anterior one-half with the punctures almost contiguous in certain portions. The tegulae are deep brownish hyaline; the first

metasomal tergum shiny, roughened, and very finely and sparsely folliculated; the seventh ventral plates as in the typical paniscus, however having the latero-basal projection very short (Timberlake states that the seventh ventral plates of the male are more quadrate and less narrowed at the outer ends than in either paniscus or mertensiae. This is so when a restricted number of males are examined, however, over the range of the subspecies the shape is no more quadrate than either of the other two subspecies. The latero-basal projection, however, is less pointed than in p. paniscus, resembling mertensiae very closely.)

The female has the pile of the face, the genal areas, and the vertex exclusively black. The mesoscutum has the pile dusky with an admixture of black pile on the median discal area; the scutellum with lateral fringes of dusky pile intermixed with black on the disc; the mesepisterna with the pile deep brown to black, long, fine, and erect; the propodeum with the latero-posterior fringes having a strong admixture of dark pile; the pile of the legs black, long, and dense; metasomal terga non-fasciate, the first tergum with a sparse covering of erect, whitish pile; metasomal terga two to five with the discs having abundant, erect, black pile; metasomal sterna non-fasciate, sterna two and three with abundant, erect, black pile forming a weak scopa; clypeus tending to be more densely, striately punctate, with the punctures shallower and much more

striate to the apex.

Distribution:

Oregon: Aneroid Lake, Blue Mountains, 7500 feet (holotype);
Wallowa Lake, Blue Mountains, 6400 feet (allotype);
Anthony Lake, 5500 to 7500 feet; North Powder.

Washington: Van Trump; Sumnerland, Mt. Rainier; Sunrise
Peak, Rainier National Park; Chinook Pass.

Idaho: Willow Flats, Franklin County.

Utah: White Pine Lake, Logan, 8000 feet; Hanna; Logan
Canyon; Mount Carmel, Zion National Park; Bells
Canyon, Salt Lake.

Wyoming: Yellowstone National Park, Roosevelt Camp.

Flight Records:

The subspecies has been taken from June 1 to August 7.

Plant Records:

Mertensia, M. paniculata.

The holotype and allotype are located at the Citrus
Experiment Station, Riverside, California.

Only in two or three specimens taken from Utah does
there appear to be any marked intergradation between
paniscus and mertensiae to the color of the pile and that
only on the mesepisterna. The morphological differences
could easily be bridged by intergradation, as Timberlake
suggests and it would appear logical to assume that at

some point in the range of the species there occurs an intermediate form.

Colletes paniscus mertensiae Timberlake

paniscus mertensiae TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 182

The male resembles p. sculleni very closely, having the pile of the vertex, upper genal areas, and the areas immediately posterior to the compound eyes with the pile long and black. The mesoscutum has abundant, dark to black pile on the disc, the scutellum with a strong admixture of dark pile on the discal area; the legs deep brown to black except for a few grey hairs intermixed on the basal portions of the femora, trochanters, and coxae; the metasomal terga are non-fasciate, terga one and two with abundant, long, erect, whitish to plae grey pile; the sterna non-fasciate; mesepisterna with the punctures much more distinct and closer than on p. paniscus, interspaces shiny; first metasomal tergum shiny, closely and finely punctate with punctures one to one and one-half puncture widths apart; second metasomal tergum very densely and finely punctate, punctures almost contiguous on the midline.

The females have the pile of the face, vertex, and genal areas black; mesoscutum strongly covered with black and dusky pile, the black predominating on the median

discaal areas; scutellum with the pile dusky to black; mesepisterna with the pile long, fine, and deep brown to black; the legs with the pile black except in having a few lighter hairs, particularly on the bases of the femora, trochanters, and the coxae; propodeum with abundant, black pile intermixed on the latero-posterior margins; metasomal terga non-fasciate, the first tergum with very narrow, lateral remnants of white fasciae; metasomal terga two to five with the discs having abundant, erect, black pubescence; metasomal sterna two and three with the discs having abundant, erect, black pile forming a very weak scopa.

Distribution:

California: Pohona trail near Yosemite Valley, June 26, 1926 (P. H. Timberlake), on flowers of Mertensia ciliata var. stomatechoides (holotype, allotype, paratypes); Yosemite, 6000 feet, July 5, 1940 (T. B. Mitchell) (paratypes); Dardanelle, July 8, 1948 (H. M., G. D., and J. Townes) (one specimen).

The holotype and allotype are at the Citrus Experiment Station, Riverside, California.

Colletes nitescens Timberlake

nitescens TIMBERLAKE 1951, Wasmann J. Biol., vol. 9, p. 187.

This species lies much closer to consors than xerophilus as indicated by Timberlake. The genitalia of the male and the light pile of the first two metasomal terga are most like those of consors, while in the females the fascial foviae of the two species are similar. Both sexes are slightly smaller than the typical consors but larger than other members of the group. The males may be confused with nigrifrons in a few key characters, but have a few dark hairs along the inner orbital margins; otherwise they differ in the close, dense puncturation of the first two metasomal terga, complete fasciae, and in the flagellar segments which are one and one-quarter times as long as broad. The females exhibit weak fasciae on metasomal terga one to five and a few dark hairs on the inner orbital margins, vertex, upper mesepisterna, scutum, scutellum, and legs. The first metasomal tergum is finely punctate with punctures about three puncture widths apart and the second tergum has the punctures larger and denser.

MALE: length 9.5 mm., wing length 6.75 mm.

Pile of face long, sparse, and white; a few black hairs along the lower inner orbital margins; vertex with pile white medially and black laterally; upper genal areas with pile predominantly white except for a few shorter black hairs anteriorly, pile becoming much longer,

denser, and whiter below; mesoscutum with pile long, sparse, and dusky; scutellum with pile long, dense, and dusky grey; mesepisterna with pile long, fine, and whitish; propodeum with weak dorsal latero-posterior fringes of long, white pile, lateral and posterior faces with sparse, erect, white pile; legs with pile sparse and white; first metasomal tergum with fasciae very narrow and weak, interrupted medially, weak lateral fringes of pile not extending to apical fascia, discal area with abundant, long, fine, erect, white pile; metasomal terga two to six with fasciae weak, narrow, and interrupted or weakest medially; metasomal terga four to six with abundant, long, erect, deep fulvous to black pile on discs, not concealing the surface; metasomal sterna two to four with short fringes of whitish to light grey pile on extreme apical margins.

Antennae brown, flagellar segments one and one-quarter times as long as broad; malar space one-third as long as broad; clypeus weakly convex, very finely and densely punctate over basal two-thirds and along median longitudinal line, apical and latero-apical margins sparsely punctate, tending to striateness at extreme lateral faces, interspaces shiny; vertex shiny, sparsely punctate. Prothoracic spines short, vestigial; mesoscutum very densely punctate, punctures approximately one-half puncture width apart, impunctate area small; scutellum not uniformly punctate over posterior one-half, punctures one to three puncture

widths apart, becoming most dense posteriorly, anterior face impunctate; mesepisterna shallowly punctate, punctures approximately one-half puncture width apart above, becoming much sparser below, punctures approximately two to three puncture widths apart on lower posterior face; propodeum with basal area very narrow and sloping posteriorly, very shallowly pitted, lateral and posterior faces dull and roughened; tegulae black; wings dusky with abundant, short, fulvous pubescence, nervures dark brown; legs black; posterior basitarsi four times as long as broad. Metasomal terga one and two finely punctate with shiny interspaces, punctures one to two puncture widths apart; metasomal tergum three with many fine punctures, slightly closer than those of the second metasomal tergum; metasomal sterna shiny, sparsely folliculated with coarse follicles over posterior one-half; seventh ventral plates roughly diamond shaped with long fringes of pile along median basal surfaces, media and lateral margins weakly reflexed.

FEMALE: length 10.5 mm., wing length 6.75 mm.

Pile of face long, erect, and white about antennal bases and supra-clypeal area, a few shorter, black hairs on lower inner orbital margins; vertex with pile with a few long hairs tinged with ochreus, abundant shorter finer black pile, particularly along lateral faces; upper genal areas with pile long and light grey, with a few shorter, black hairs intermixed at anterior face, pile

becoming longer and pure white below; mesoscutum with a dense covering of long, erect, light grey pile on anterior one-third and about lateral margins, disc with scattered, fine, black hairs; scutellum with a dense fringe of light grey pile about lateral and posterior margins; mesepisterna with pile long, fine, and light grey; metapleura with abundant, fine, dark black hair on upper portions; propodeum with long, dense fringes of white pile on upper latero-posterior margins, lateral and posterior faces with sparse, erect, white pubescence; pile of femora long, plumose, white to tinged with yellow; pile of tibiae and basitarsi strongly intermixed with short, black hair; first metasomal tergum with a very weak, apical fascia of white pile, fascia interrupted broadly medially, lateral fringes very weak and sparse, not extending to apical fascia, discal area with sparse, long, erect, whitish pile; metasomal terga two to five with fasciae weak and narrow, pure white; metasomal terga three to five with abundant, short, erect, black pile; metasomal sterna with weak apical fringes of white pile, discal area with abundant, erect, short pile, whitish laterally, more ochreous medially, forming a weak **scopa**.

Antennae brownish black, flagellar segments three-quarters as long as broad; malar space one-third as long as broad; clypeus convex, rounded, very densely punctate over entire surface, punctures weakly striate, more so apically;

vertex shiny and punctate, punctures one puncture width apart, fascial foviae broad to the dorsal rim, extending almost half way to lateral ocelli. Prothoracic spines vestigial; mesoscutum densely and finely punctate about anterior one-third and lateral margins, impunctate area large; scutellum with punctures restricted to posterior one-half, anterior one-half shiny, impunctate; mesepisterna shiny and shallowly punctate, punctures one to two puncture widths apart; propodeum with basal area narrow and shallowly, quadrately pitted, lateral and posterior faces dull and very finely roughened; tegulae deep brown to black; wings dusky, densely covered with fulvous pubescence, nervures deep brown; legs brownish black; posterior basitarsi three and three-quarter times as long as broad. First metasomal tergum shiny, very finely punctate, punctures two to four puncture widths apart, sparser medially; second metasomal tergum very coarsely folliculated, follicles almost identical in size to punctures of first tergum but much denser; metasomal sterna dull, very densely folliculated over entire surface, last metasomal sternum with apical one-half sharply depressed, shiny.

Distribution:

California: Wood Lake, Tulare County, taken rotary trap April 8, April 26 and May 2, 1947 (N. W. Frazier) (holotype, allotype and paratype); Bass Lake,

June 6, 1938, 2500 feet (N. F. Hardman)
(paratype).

The holotype is in the collection of the Citrus
Experiment Station, Riverside, California.

Colletes californicus Provancher

californicus PROVANCHER, 1895, Natural. Canadian,
vol. 22, p. 189; COCKERELL, 1903, Psyche, vol. 10, p. 74;
VIERECK, 1903, Proc. Acad. Nat. Sci. Philadelphia, 1902,
p. 730; COCKERELL, 1905, Bull. So. California Acad. Sci.,
vol. 4, p. 31; BRAY, 1917, Pomona J. Ent. Zool., vol. 9,
p. 99; COCKERELL, 1938, Ann. Mag. Nat. Hist., ser. 11,
vol. 2, p. 151; COCKERELL, 1939, Proc. California Acad.
Sci., ser. 4, vol. 23, p. 427; TIMBLAKE, 1951, Wassman
J. Biol., vol. 9, p. 181.

This is a vernal species restricted to the southern
coastal area of California. Both sexes show a little
variation in the length of the prothoracic spines, but
they are always at least as long as the width across the
base of the spine, usually much longer. The males can
readily be distinguished from all other members of the
consors group in having black pile along the inner orbital
margins and in having long prothoracic spines. In the
females the prothoracic spines are also long, the face
is covered with black pile and there is a complete absence

of abdominal fasciae.

MALE: length 8 mm., wing length 6 mm.

Pile of face long and white over median clypeal area and supra-clypeal area, abundant black pile along inner orbital margins; vertex with black, erect pile; upper genal areas with pile black, becoming lighter to deep brown laterally and white below; pile of mesoscutum and scutellum long, dense, and white; mesepisterna with pile black; propodeum with long fringe of white pile on extreme upper latero-posterior margins, lateral and posterior faces with abundant, erect, fine, black pile; pile of legs black except on anterior femora, which are fringed with white to light grey pile; metasomal terga with fasciae absent, terga one to six with abundant, long, erect, black pile; metasomal sterna with pile sparse, long, and black.

Antennae deep reddish brown, flagellar segments scarcely longer than broad; malar space three-eighths as long as broad; clypeus weakly convex, finely and densely punctate over basal one-half and along median longitudinal line, apico-lateral margins finely, striately punctate; vertex shiny, sparsely punctate. Prothoracic spines long and sharp, approximately one and one-half times as long as width across base; mesoscutum finely and densely punctate, punctures no more than one puncture width apart, impunctate area large; scutellum finely and densely punctate over posterior half, punctures becoming much finer and sparser

anteriorly, scutellum not striately punctate; mesepisterna shallowly punctate with shiny interspaces, punctures approximately one puncture width apart above, becoming much sparser below; propodeum with basal area very narrow and shallowly, quadrately pitted, pits almost indistinguishable medially, lateral and posterior faces shiny and finely punctate, punctures one to four puncture widths apart; tegulae deep brown; wings dusky with abundant, fulvous pubescence, nervures brown; legs black; posterior basitarsi three and one-half times as long as broad. Metasomal terga one, two, and three finely punctate with shiny interspaces, punctures one to two puncture widths apart, terga with lighter brownish apical depressions; metasomal sterna shiny, rather densely folliculated; seventh ventral plates semi-lunar in shape, rather densely fringed along the apical margins.

FEMALE: length 9.5 mm., wing length 7 mm.

Pile of face long, erect, and black, clumped principally about antennal bases and along inner orbital margins; vertex with pile black; upper genal areas with abundant, erect, black pile, pile becoming brownish towards lower faces; mesoscutum with abundant, erect, long, whitish pile on anterior and lateral margins, a few darker hairs on central discal area; scutellum with pile predominantly light grey, a few dark hairs intermixed on disc; mesepisterna with the pile long, fine, deep brown to

black; propodeum with long fringes of pile along the latero-posterior margins, upper margins with pile predominantly light, intermixed with black laterally, becoming pure black along lower latero-posterior margins, lateral and posterior faces with abundant, fine, erect, black pile; pile of legs deep brown to black, long and dense; metasomal terga non-fasciate, with abundant, short, erect, black pile over discal areas of terga one to six; metasomal sterna with sparse, scattered, erect, black pile.

Antennae reddish brown, short, flagellar segments approximately five-eighths as long as broad; malar space one-third as long as broad; clypeus weakly convex, closely and rather coarsely striately punctate over entire surface, interspaces shiny; vertex shiny and very sparsely and feebly punctate, fascial foviae very broad above and narrowed below, shallowly depressed and impunctate, reaching almost half way to lateral ocellus. Prothoracic spines long and sharp, approximately one and one-half times as long as width across base; mesoscutum finely and densely punctate, punctures approximately one puncture width apart, impunctate area large; scutellum finely and densely punctate about posterior margins, punctures sparser on median discal area and almost absent anteriorly; mesepisterna shallowly and rather densely punctate, punctures much denser above; propodeum with basal area very narrow and shallowly, quadrately pitted, pits half as long as broad, lateral and

posterior faces shiny and very finely roughened; tegulae deep brown; wings dusky with abundant, long, fulvous pubescence, nervures deep brown; legs black to deep brown; posterior basitarsi three times as long as broad.

Metasomal terga one and two sparsely and shallowly punctate, punctures two to four puncture widths apart, interspaces shiny, punctures of second metasomal tergum finer than those of first; metasomal sterna dull and rather densely folliculated, apical metasomal sternum with apical two-thirds depressed and not covered with pubescence, depression rimmed on the basal margin by long, overlapping, black hairs.

Distribution:

The species is restricted as far as known to the southern and central portion of California; taken at the following localities; Riverside; Antioch; Altadena; Deep Creek, San Bernadino County; Banning; Cranston Ranger Station near San Jacinto; Palmdale; Little Rock; Los Angeles; Lancaster; Gavilan; Bakersfield; Hemet Reservoir, San Jacinto Mountains; mouth of San Antonio Canyon, Los Angeles County; San Gabriel; Campo, San Diego County; Mojave; Redlands.

Flight Records:

The species has been collected in the interim from March 30 to May 31.

Plant Records:

Baccharis, Cryptantha, Phacelia distans, Phacelia tanacetifolia,
Layia platyglossa.

The holotype is located in the Quebec Public Museum,
Quebec City, Quebec, Canada.

Colletes nigrifrons Titus

nigrifrons TITUS, 1900, Canadian Ent., vol. 32, p. 304;
COCKERELL, 1901, Psyche, vol. 9, p. 283; VIERECK, 1903,
Trans. Amer. Ent. Soc., vol. 29, p. 59; COCKERELL, 1906,
Bull. Amer. Mus. Nat. Hist., vol. 22, p. 424; COCKERELL,
1906, Trans. Amer. Ent. Soc., vol. 32, p. 291; COCKERELL,
1907, Univ. Colorado Studies, vol. 4, p. 239; COCKERELL,
1923, Canadian Ent., vol. 55, p. 206; TIMBERLAKE, 1943,
Bull. Amer. Mus. Nat. Hist., vol. 81, p. 387.

florissantia COCKERELL, 1906, Bull. Amer. Mus. Nat.
Hist., vol. 22, p. 425; COCKERELL, 1907, Univ. Colorado
Studies, vol. 4, p. 240; TIMBERLAKE, 1943, Bull. Amer.
Mus. Nat. Hist., vol. 81, p. 387.

polemonii COCKERELL, 1906, Bull. Amer. Mus. Nat. Hist.,
vol. 22, p. 425; COCKERELL, 1907, Univ. Colorado Studies,
vol. 4, p. 240; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat.
Hist., vol. 81, p. 387.

This is another montane species occurring in the mountains from eastern California about the northern rim of the Great Basin through Idaho and Wyoming and thence into Colorado. It is one of the smaller members of the consors group, flying generally early in the summer.

The males of the species are rather distinctive in having no black pile on the head, thorax, or legs, and having metasomal terga one and two usually sharply and sparsely punctate with punctures much denser on two than on one. The seventh ventral plates are semi-lunar in shape with rather dense rims of hair along the transverse mid-line.

The female has the head, mesepisterna, and legs all completely covered with a rather sparse, black pile; metasomal terga one and two are deeply and densely punctate with punctures about one to two puncture widths apart, although somewhat closer on the second metasomal tergum; fasciae are present on metasomal terga one to four or five and usually, but not always, complete, at times interrupted medially; and the malar space is almost linear.

There are a few specimens in my possession taken from Whitehorse in the Yukon, Cameron Bay on Great Bear Lake, Northwest Territories, and from Thunder River, Great Whale River, and Seven Islands, Quebec. The distribution is spotty and erratic over this northern part of the

continent and records are absent from the area between Banff, Alberta, and the Yukon. This series of nigrifrons, extending from the Yukon to Quebec is composed of 4 males and 5 females and in none of the specimens can I detect any difference from the typical population as described by Titus from Colorado.

MALE: length 8 mm., wing length 6 mm.

Pile of face long, dense, and white to light grey, completely concealing clypeus and lower antennal bases; vertex with pile sparse, erect, and light grey to tinged with light ochreus; upper genal areas with pile erect and light grey to tinged with light ochreus, pile becoming much longer and whiter below; mesoscutum with abundant, long, erect, dusky pile; scutellum with pile long, fine, and dusky, concentrated principally on the lateral and posterior faces; mesepisterna with abundant, long, fine, dusky to light grey pile; propodeum with long fringes of dkusky pile on upper latero-posterior margins, lateral and posterior faces sparsely covered with shorter, erect pile; pile of legs long, sparse, and dusky; first metasomal tergum with apical fascia narrow and white, usually interrupted medially, lateral fringes of light grey pile weak, barely distinguishable, disc with abundant, erect, dusky pile; metasomal terga two to five with fasciae broader, whiter, and more dense, entire; metasomal terga

three to six with the discs having a sparse covering of erect, light grey pile intermixed with much shorter, finer, black pile, light pile predominating; metasomal sterna two to four with very weak apical fringes of light grey pile.

Antennae short, deep brown to black, flagellar segments as long as broad; malar space short, approximately one-third as long as broad; clypeus convex, very finely and densely punctate about fronto-clypeal margins and over basal two-thirds, punctures not at all striate, with shiny interspaces, apex and latero-apical margins with punctures much coarser and sparser and having broad, shiny interspaces; vertex dull, coarsely and densely punctate, with narrow, shiny interspaces. Prothoracic spines short and rather blunt, scarcely shorter than width across the base; mesoscutum finely and rather densely punctate, with shiny interspaces, punctures approximately one-half to one puncture width apart, becoming sparser toward the median impunctate area; scutellum very densely, almost contiguously punctate over posterior one-third, punctures becoming sparser and more distinct on the median discal area, anterior one-quarter shiny, impunctate; mesepisterna rather distinctly punctate with shallow punctures, punctures approximately one puncture width apart with shiny interspaces; propodeum with basal area sloping ventrally, obscurely and shallowly pitted with irregular pits, lateral and posterior faces

dull and finely roughened; tegulae deep brown to blackish hyaline; wings dusky with abundant, deep fulvous pubescence, nervures dark brown; legs deep brown to black; posterior basitarsi approximately about 3.3 times as long as broad. First metasomal tergum shiny, distinctly punctate, punctures one to three puncture widths apart; second metasomal tergum much more closely punctate with punctures one-half to two puncture widths apart; metasomal sterna shiny, finely and sparsely folliculated, last metasomal sternum convex medially with truncate shoulders laterally; seventh ventral plates semi-lunar in shape with rather dense fringes of hair along transverse mid-line.

FEMALE: length 9 mm., wing length 6.5 mm.

Pile of face, vertex, and genal areas short, erect, and black; mesoscutum with pile predominantly black, intermixed with a dusky hairs, particularly on anterior and lateral margins; scutellum with pile predominantly black, with a few, deep dusky hairs, particularly on lateral margins; mesepisterna with pile long, fine, and black; propodeum with fringes of short, black to dusky pile on the upper latero-posterior margins; legs with pile deep brown to black, rather sparse and short on first two pairs, becoming very long, dense, and plumose on the posterior legs; first metasomal tergum with apical fascia white, evident on lateral one-third of the segment, broadly interrupted medially, lateral fringes are very

weak and composed of short, erect, black pile, disc very sparsely covered with short, erect, dark pile; metasomal sterna two to four with fasciae white to light grey, broadly interrupted medially; metasomal terga two to five with discs having abundant, short, erect, black pile; metasomal sterna two and three with discs having abundant, erect, black pile forming a very weak scopa.

Antennae short, deep brown to black, flagellar segments three-quarters as long as broad; malar space one-quarter as long as broad, becoming slightly broader at posterior mandibular articulation; clypeus convex, coarsely and striately punctate over entire surface with shiny interspaces; vertex rather densely and coarsely punctate with shiny interspaces, punctures no more than one puncture width apart. Prothoracic spines about as long as width across the base, sharp; mesoscutum finely and rather densely punctate over anterior one-third and lateral margins, punctures one-half to one puncture width apart, impunctate area large; scutellum densely, contiguously punctate about extreme lateral and posterior margins, disc with punctures much sparser and separated by shiny interspaces, a weak median longitudinal groove extending to anterior margin; mesepisterna rather densely punctate with shiny interspaces, punctures no more than one puncture width apart; propodeum with basal area sloping ventrally, shallowly and obscurely pitted with irregular pits, lateral

and posterior faces dull and finely roughened; tegulae black; wings dusky with abundant, deep fulvous pubescence, nervures dark brown; legs black; posterior basitarsi approximately 2.8 times as long as broad. First metasomal tergum finely punctate with punctures not uniform in size, punctures ranging from one to three puncture widths apart; second metasomal tergum more densely punctate than first, with punctures one-half to two puncture widths apart; metasomal sterna dull, coarsely and densely folliculated, last metasomal sternum with apical one-half sharply depressed with a basal arcuate hair band overhanging apical depressed area, pile black.

Considerable variation exists in the colour of the pile of the mesoscutum and scutellum; in the majority of cases the pile of both the mesoscutum and scutellum is strongly intermixed with black, however many specimens have the pile of both the mesoscutum and scutellum with few or no black hairs intermixed, being almost exclusively dusky or tawny grey. Material from California, Utah, as well as those females from northern Canada tend to have the pile exclusively tawny to dusky, occasionally with a few dark hairs on the discs of the scutellum and the mesoscutum.

Distribution:

Colorado: Florissant; Peaceful Valley; Leadville;
Longspeak; Summit Road Ouray; Pinecliffe;
Boulder; Science Lodge, Boulder County; Ward;

Gold Hill; Ohio; Creede; Eldora; Wilkerson
Pass; Salida; Westlake.

New Mexico: Las Vegas.

Arizona: Kanibab Forest.

Wyoming: Jenny Lake, Grand Teton National Park; mountains
near Sheridan; Jackson; Yellowstone National
Park; Stewart River Station.

Utah: Kastle Valley; Castleton; Hanna.

California: Base of Mt. Dana; Tuolumne County; Soda
Springs, Tuolumne County; Fresno County;
Inyo County; Mono County; Mammoth; Mineralking;
Tamarack Lake.

Alberta: Waterton Lakes; Calgary; Banff; Cowley.

Alaska: Skagway.

Yukon Territories: Whitehorse.

Northwest Territories: Cameron Bay, Great Bear Lake.

Quebec: Seven Islands; Thunder River; Great Whale River.

Flight Records:

The species has been recorded as flying between May 10
and August 10, being found in greatest abundance during
the months of June and July.

Plant Records:

Dryocallis fissa, Lambertii, Mertensia sibirica, Oxytropis,
Potentilla hippiana.

Colletes xerophilus Timberlake

The males of the species very closely resemble nigrifrons and could well fall within the expected subspecific variation of that species were it not for the distinctive differences exhibited by the female. The male differs from nigrifrons in having the flagellar segments approximately one and one-quarter times as long as broad, and in having the puncturation of the first metasomal tergum much finer and sparser, almost folliculated.

The females resemble nigrifrons in size but are rather distinctive in having the head and the mesepisterna with the pile all light. The metasomal terga are impunctate and shiny; and only the legs covered with black pile.

The clypeus is short and rounded with a shallow median depressed longitudinal sulcus.

MALE; length 7.5 mm., wing length 5.25 mm.

Pile of face long, white, and dense, particularly above antennal bases and over clypeal area; genal areas with pile sparse and pale grey, becoming much longer below; mesoscutum and scutellum with sparse, long, erect, light grey to dusky pile; mesepisterna with abundant, long, erect, pale grey pile, becoming much whiter below; pile of legs short and sparse and pale grey to white; propodeum with pile long and dense, particularly on latero-posterior

margins, lateral and posterior faces with a few, sparse, erect, pale grey hairs; first metasomal tergum with abundant, long, erect, pale grey pile on discal area, lateral fringes weak to absent; metasomal terga two to six with abundant, long, erect, grey to dusky pile on discal area; metasomal sterna two to four with weak apical fringes of dusky pile.

Antennae deep brown, flagellar segments about one and one-quarter times as long as broad; malar space one-half as long as broad; clypeus long, rather finely and densely punctate over basal half, punctures becoming much sparser and much more striate apically; vertex coarsely punctate with shiny interspaces, punctures one to one and one-half puncture widths apart. Prothoracic spines very short and sharp; mesoscutum finely punctate, punctures one to three puncture widths apart, impunctate area large; scutellum very densely and finely, almost contiguously punctate about lateral and posterior faces, punctures becoming sparser and more distinct on median discal area where they are approximately one puncture width apart, anterior one-third shiny, impunctate; mesepisterna finely and shallowly punctate with punctures approximately same size as those of mesoscutum, punctures one to two puncture widths apart, being sparser below; propodeum with basal area sloping sharply ventrally, very shallowly, obscurely, quadrately pitted, propodeum dull and roughened,

latero-posterior margins broadly rounded; tegulae brownish hyaline; wings feebly dusky with sparse covering of fulvous pubescence, nervures brown; legs dark brown; posterior basitarsi long and slender, approximately three and three-quarters times as long as broad. Metasomal terga one and two very finely and sparsely punctate, punctures two to four puncture widths apart with broad, shiny interspaces, punctures slightly closer on second tergum; second metasomal tergum with a very shallow basal depression; metasomal sterna shiny, sparsely and finely folliculated; seventh ventral plates closely resembling those of C. nigrifrons, however with plate portion semi-circular, latero-basal portions weakly projected in the form of a nipple-like projection, plates with denser medio-basal and latero-basal tufts joined by a shorter transverse fringe of pile, apex covered with very fine and sparse pile (See fig. 65).

FEMALE: length 9 mm., wing length 6.25 mm.

Pile of face about antennal bases long and white to pale grey; mesoscutum with pile pale grey to white on anterior one-half and on lateral margins; mesepisterna with pile long, fine, and pale grey; propodeum with rather dense fringes of grey pile on latero-posterior margins, most dense on upper surfaces, lateral and posterior faces with a very few, erect, pale grey hairs.

Antennae short, deep reddish brown to black, flagellar

segments three-quarters as long as broad; malar space approximately one-third as long as broad at anterior mandibular articulation, much broadened at the posterior mandibular articulation where it approximates one-half as long as broad; clypeus convex, apical margin emarginate medially and with a trace of a longitudinal median groove separating surface into two weakly convex lateral portions, surface rather densely punctate over basal half, punctures becoming more striate and sparser apically, with shiny interspaces; vertex shiny, rather densely punctate, punctures one-half to one puncture width apart, fascial foviae very narrow, extending along inner orbital margins dorsally just above the inner margin of the compound eye. Prothoracic spines very short and sharp; mesoscutum finely and sparsely punctate, punctures one to two puncture widths apart on anterior one-half and lateral surfaces, becoming much sparser and irregular on median discal area, impunctate area large; scutellum rather densely and finely punctate about extreme lateral and posterior margins, discal area sparsely and finely punctate, punctures just slightly coarser than those of mesoscutum, median discal area shiny, virtually impunctate; mesepisterna finely punctate, punctures approximately one puncture width apart; propodeum with basal area sloping sharply ventrally, very shallowly and obscurely quadrately pitted, lateral and posterior faces dull, very finely roughened; wings feebly

dusky with abundant, deep fulvous pubescence, nervures brown; legs deep brown to black; posterior basitarsi three and three-quarters times as long as broad. First metasomal tergum shiny, virtually impunctate, finely and sparsely folliculated; second metasomal tergum much as first with follicles a little closer, second metasomal tergum with a very shallow, obscure basal depression; metasomal sterna densely and coarsely folliculated, dull, last metasomal sternum with apical five-eighths sharply depressed with a long basal arcuate fringe of overhanging pile.

The species is divided into three subspecies. These subspecies are known from so few specimens that their status can only be certainly determined when more material becomes available.

Colletes xerophilus xerophilus Timberlake

xerophilus TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 184-6.

MALES;

Pile of the head, vertex, and occiput entirely light; thorax with pile entirely white to tinged with pale grey, metasomal terga one to five with very faint apical fasciae of whitish to light grey pubescence, fasciae scarcely discernible; tegulae brownish hyaline; nervures light brown.

FEMALES:

Few black hairs along inner orbital margins and scattered on clypeal and subantennal areas; vertex with a few intermixed black hairs; genal areas with pile tinged with fuscous, compound eyes darker; mesoscutum and scutellum with pile having a strong admixture of dark brown, principally on discal areas; pile of legs predominantly dark brown on the femora, tibiae, and tarsi, however with a few lighter hairs in femoral fringes; metasomal terga one to five with very weak apical fasciae of white pile, barely evident medially, discernible as white fringes on lateral portions in particular of first three metasomal terga; metasomal sterna one to five with discs having abundant, erect, black and yellowish pile, forming a very weak scopa, last metasomal sternum with apical depression having an arcuate band of long, deep brown to black, overhanging pile; tegulae brownish hyaline; nervures brown.

Distribution:

California: Westmoreland, Imperial County, March 23, 1930 (P. H. Timberlake) on flowers of Salix gooddingii. (holotype, allotype and paratypes); Blythe, Riverside County, April 3, 1945 (Linsley and MacSwain) on flowers of Salix (paratype

I have provisionally placed the 2 female paratypes

classified by Timberlake as x. sonoranus from Westmoreland, California, with this subspecies, as is indicated in the discussion under x. sonoranus.

The holotype is located at the Citrus Experiment Station, Riverside, California.

Colletes xerophilus sonoranus Timberlake

xerophilus sonoranus TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 186.

MALE: Unknown.

FEMALE: Differs from xerophilus in having a few darker hairs along inner orbital margins; pile of the vertex, genal areas, and thorax entirely light, grey to tinged with light fuscous; legs with pile long, dense, and lightly tinged with ochreus; metasomal terga one to five with apical fasciae broad, dense, and pure white, occasionally interrupted medially on first metasomal tergum, lateral fringes of long, white pile extending to the apical fascia; metasomal terga one to six with abundant, erect, white pile on discs; metasomal sterna two to five with abundant, erect, light ochreus pile forming a very weak scopa, last metasomal sternum with apical depression having an arcuate band of long, overhanging, dusky to light ochreus pile;

tegulae brownish hyaline; nervures light brown.

Distribution:

New Mexico: Pecos, June 9 (T. D. A. Cockerell) on flowers of Salix (holotype and paratype located at the Citrus Experiment Station, Riverside, California).

Timberlake, in describing this subspecies, included two females which were taken at the same place, same time, and on the same flowers as the females and males of x. xerophilus. These specimens are here placed with x. xerophilus. Accompanying this removal of the Westmoreland specimens to xerophilus it is necessary to assume either that the colour of the pile of the legs is a character controlled by a simple genetic mechanism and that light and dark-legged specimens are found in the same population, or if the character is not simple, which appears most probable, that the sonoranus be elevated to specific rank. Unfortunately I do not have any additional material to that examined by Timberlake and am obliged to follow, temporarily at least, the former of the two assumptions.

Colletes xerophilus cismontanus Timberlake

cismontanus TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 186-7.

In the original description, Timberlake suggests that "it is reasonable to suppose that cismontanus will ultimately prove to be a coastal race of xerophilus." While I have not seen further specimens of further material from southern California, I would not hesitate to list cismontanus as a subspecies of xerophilus. There is less difference between xerophilus and cismontanus than exists between the subspecies xerophilus and sonoranus (New Mexico specimens).

MALE: Few, darker hairs along inner orbital margins and on vertex, a few dark hairs just posterior to compound eyes; metasomal terga with apical fasciae absent; terga one to five with abundant, long, fine, white to pale grey pile; tegulae deep brown to black; nervures light brown.

FEMALE: Abundant, black pile along inner orbital margins, and intermixed on clypeus and below antennal bases; vertex with a few, erect, black hairs; upper genal areas with the pile strongly intermixed with black, areas immediately posterior to each compound eye with abundant, long, fine, black pile; mesoscutum and scutellum with a few darker hairs on median discal area; pile of legs black, except for an admixture of lighter pile, particularly on femoral fringes; metasomal terga with discs of three to five with abundant, erect, black pile; metasomal sterna two to four with abundant, erect, black pile forming a weak scopa, last metasomal sternum with apical depression having an arcuate band of

long, overhanging, ochreous black pile; tegulae brownish black; nervures dark brown; propodeum with basal area very shallowly, obscurely pitted.

Distribution:

California: Hemet, Riverside County, May 10, 1936
(E. G. Linsley) (holotype and allotype located at the Citrus Experiment Station, Riverside, California).

Colletes sphaeralceae Timberlake

sphaeralceae TIMBERLAKE, 1951, Wasmann J. Biol.,
vol. 9, p. 189.

This is a member of the consors group most closely allied to C. c. mesocopus Swenk. The species is restricted to the extreme southwestern portion of the United States, found both in the lowlands and at altitudes up to 9700 feet. The genitalia of the male are distinctive as illustrated and the seventh ventral plates do not appear to resemble other members of the consors group. The female has the apical half of the last sternum depressed apically and with a long fringe of light ochreous pile overhanging the apical depression, closely resembling other females of the group. The present work extends the listed range of the species to Lincoln County, Nevada, and

one male has been examined from Trout Creek, Utah. The specimen from Utah differs slightly from the typical series in having the pile of the face, mesoscutum, and scutellum longer, pure white, and very dense, concealing the surfaces; it is similar in all other respects.

MALE: length 7.5 mm., wing length 6 mm.

Face with pile long, erect, sparse, and slightly tinged with grey, not completely concealing clypeal area, most dense about lateral portions of antennal basal area; vertex with few scattered, fine, white hairs; genal areas weakly covered with fine white pile, becoming much longer and whiter below; mesoscutum with pile fine, sparse, white to pale grey, not at all concealing surface; scutellum with pile long and white principally about lateral and posterior faces; mesepisterna sparingly covered with long white pile; propodeum with no dorso-lateral clump of pile, lateral and posterior faces sparsely covered with long, erect, white hairs; legs with pile short, sparse, and white; metasomal terga one to five with dense apical fasciae slightly tinged with pale grey medially, fasciae much broadened at lateral margins; metasomal tergum one with weak lateral fringes of pale grey to white pile, disc and anterior face with sparse, long, pale grey hairs; metasomal terga two to six having discs with abundant short black pile; metasomal tergum

six with no apical fascia; metasomal tergum seven with pile deep brown to black, and appressed; metasomal sterna with narrow apical bands of short white pile, discs with abundant short, semi-appressed, pale grey pile.

Antennae short, deep brown to black, flagellar segments about as long as wide, usually slightly shorter; malar space three-eighths as long as broad; clypeus short, weakly convex, closely and densely striately punctate, punctures finer basally, becoming coarser and sparser toward apex; vertex shiny, sparsely punctate with broad shiny interspaces. Prothoracic spines short, sharp, roughly striangular; mesoscutum finely and densely punctate, punctures one-half to one puncture width apart about anterior and lateral margins, impunctate area large; scutellum densely and finely punctate over posterior three-quarters of surface, not striately or rugosely punctate, shallow longitudinal median groove most evident on anterior half; mesepisterna densely and coarsely punctate, punctures no more than one-half puncture width apart; propodeum with lateral and posterior faces very finely roughened, posterior face with rudiments of sparse, fine, scattered punctures, surface somewhat shiny; tegulae deep brown, nervures deep brown; wings with apical half having abundant fine, brownish pubescence; legs black, tarsi brown apically; posterior basitarsi three times as long as broad, much broadened apically. Metasomal tergum one finely and

densely punctate, surface dull, punctures one to two puncture widths apart, sparser medially where there is an elevated longitudinal impunctate ridge; metasomal terga two to five finely and densely punctate, punctures almost contiguous, surface dull and roughened; metasomal sterna finely and densely punctate or folliculated with shiny interspaces.

FEMALE: length 9 mm., wing length 7 mm.

Face with pile long, white, and sparse about antennal bases and inner orbital margins, few long white hairs overhanging clypeus from fronto-clypeal suture; vertex with pile white to pale grey, genal areas with upper surface having pile long and white, becoming much longer and finer below; mesoscutum with pile white, sparser posteriorly; scutellum with pile pale grey concentrated principally about lateral and posterior margins, with a few shorter stouter hairs on disc; mesepisterna with pile long, sparse, fine, and pure white; propodeum with dorso-lateral clump of long white pile, lateral and posterior faces with few fine short hairs; legs with pile short, sparse, and pale grey, posterior femora and tibiae with pile long, curved, plumose, and tinged with ochreus; posterior basitarsi with a few long straight hairs extending out from lateral margins; metasomal terga one to five with broad dense apical fasciae of pure white pubescence; metasomal tergum

one with weak lateral fringes of pure white pile, disc and anterior face with a few scattered, long, fine hairs; metasomal terga two to five with abundant short, deep brown to black, erect pubescence on discs; metasomal tergum six with pile golden to deep brown, and appressed; metasomal sterna having discs with abundant erect, deep ochreous pile.

Antennae short, brown, flagellar segments about one-half as long as broad; malar space about one-quarter as long as broad, broadest at posterior mandibular articulation; clypeus short and weakly convex, densely striately punctate with shiny longitudinal interspaces, punctures finer and denser basally; vertex shiny, sparsely but finely folliculated. Prothoracic spines short and sharp, roughly triangular; mesoscutum with punctures fine and dense over anterior one-third, punctures sparser posteriorly, impunctate area large; scutellum with anterior one-third shiny, impunctate, punctures becoming finer and denser toward posterior margin, never striate; mesepisterna densely and coarsely punctate with punctures no more than one-half puncture width apart; propodeum with lateral and posterior faces very finely roughened, not striate or rugose, posterior face with a few sparse fine punctures, basal area weakly pitted; tegulae light hyaline brown, nervures deep brown; wings dusky with abundant short brown pubescence over apical half; legs black except apical tarsal segments which tend to brown; posterior basitarsi three times as

long as broad. Metasomal tergum one shiny, very finely punctate or folliculated with follicles two to five puncture widths apart, a longitudinal median impunctate ridge most evident on apical portion of disc; metasomal terga two to four densely folliculated, dull; metasomal sterna dull, weakly roughened, apical margins hyaline impunctate; last metasomal sternum having apical half abruptly depressed and hyaline with rim of light ochreous pile overhanging depression from margin.

Distribution:

California: Pinon Flat, Idyllwild, Ribbonwood, Saunders Meadoes, and Hemet Reservoir in the San Jacinto Mountains; Westgard Pass Plateau, Kearsarge Pass, Olancha, Owens Valley, Independence, Wild Rose Canyon, Panamint Mts., Lone Pine, and Mazourka Canyon, in Inyo County; Palm Springs; Tauquitz Lodge, Riverside County; Kramer Jct., San Bernardino County.

Nevada: Montgomery; Oak Springs, Lincoln County; Lovelock; Kyle Canyon, Charleston Mts.

Arizona: Wickenburg; 10 miles east of Holbrook.

Utah: Trout Creek.

Flight Records:

The species has been recorded as flying between March 26 and July 7 with the peak of the population appearing from March to May in the lowland desert region

and from May to July in the mountains.

Plant Records:

Sphaeralcea ambigua.

The holotype is located in the collection of the Citrus Experiment Station, Riverside, California.

Colletes wickhami Timberlake

wickhami TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 394; TIMBERLAKE, 1951, Wassman J. Biol., vol. 9, p. 191.

The female of this species is as yet unknown, although I have a number unassociated females taken with males in Texas and New Mexico. The association of the sexes is still uncertain and further collections will be necessary to substantiate my association. On the basis of the quadrate dorso-apical expansion of the penis valves as well as the elongate volsellae and short gonostyli, the species, as Timberlake suggests, is a member of the consors group. Some variation is found through the range of this uncommon species. The clypeus of the California paratype taken near Whittier is much more striately punctate with weak longitudinal rugae, while the eastern specimens have a smooth nonrugose surface with punctures sparse and course with shiny interspaces. The mesopleura of the

Whittier specimen is slightly more coarsely and densely punctate above and the metasomal sternal fasciae tend to be incomplete at the mid line.

The present work extends the known range of the species to Arizona, New Mexico, Texas and Kansas.

MALE: length 8 mm., wing length 6 mm.

Hair of face long, dense and pure white, completely concealing clypeus; vertex and upper genal areas with sparse short erect pile, not at all concealing the surface, pile becoming much longer and more plumose below; mesoscutum with pile white and dense, particularly over anterior two thirds; scutellum with dense white peripheral rim of pile; mesepisterna with pile long, weakly plumose and white; propodeum with weak fringes of pale grey pile on latero-posterior margins, lateral and posterior surfaces sparsely covered with erect pale grey pile; legs with pile short, sparse and white; first metasomal tergum with broad apical fascia of white pubescence, tergum with lateral fringes of white pile extending to fascia, discal area sparsely covered with fine white pile; metasomal terga two to five with fasciae broad, and white; metasomal terga four to six with discal areas covered with erect pale grey to deep testaceous pile; metasomal sterna with fasciae as long lateral fringes, broadened slightly medially, median pile shorter and denser.

Antennae reddish brown, flagellar segments one and one

quarter times as long as broad; malar space three quarters as long as broad; clypeus weakly convex, sparsely striately punctate with shiny interspaces, punctures most dense along median longitudinal line, apical and apico-lateral margins sparsely punctate; vertex shiny with a few fine punctures. Prothoracic spines short and sharp, about as long as width across base; mesoscutum densely punctate over anterior one half, impunctate area large; scutellum coarsely and sparsely punctate over posterior one half, anterior one half shiny impunctate; mesepisterna coarsely punctate with shiny interspaces, punctures slightly larger than those of mesoscutum; propodeum with basal area shallowly quadrately pitted, lateral faces weakly rugose, shiny, posterior face dull and weakly traversed by striae; tegulae brownish; wings whitish hyaline, with sparse light ochreous pubescence, nervures light brown; legs reddish brown to deep brown; posterior basitarsi three and one half times as long as broad. First metasomal tergum densely punctate, punctures about one puncture width apart laterally to two to three puncture widths medially; second metasomal tergum with punctures of similar size but slightly closer, no more than two puncture widths apart; metasomal fasciae lying in shallow apical depressions; second metasomal tergum with sharp basal depression; metasomal sterna densely and coarsely folliculated over apical one half; seventh ventral plates elongate quadrate with apical two thirds very weak and hyaline, almost membranous, a

clump of pile on basal portion (see fig. 67).

Distribution:

California: near Whittier, October 11, 1928 (paratype),
Oro Grande, San Bernardino County, October 28,
1934 (C. D. Michener) on Chrysothamnus
nauseosus; Colton, May 26-28, 1917.

Arizona: Douglas, June 16, 1942 (E. C. Van Dyke).

New Mexico: Carrizozo, June 10, 1950 (L. O. Beamer) on
Helenium laciniatum; Carrizozo, June 10, 1950
(J. G. Rozen).

Texas: Cooper's Store, Big Bend Park, April 11, 1949
(Michener, Beamer) on Phacelia popei; 36 miles south
Sonora, April 10, 1950 (Beamers, Stephen, Michener,
Rozen); Menard, May 2, 1926 (F. C. Bishopp).

Kansas: Johnson, June 16, 1949 (C. D. Michener) on
Quincula lobata.

The holotype is located in the American Museum of
Natural History.

Colletes chamaesarachae Cockerell

chamaesarachae COCKERELL, 1897, Ann. Mag. Nat. Hist.,
ser. 6, vol. 19, p. 49; COCKERELL, 1897, Bull. Univ. New
Mexico, vol. 24, p. 19; COCKERELL, 1898, Bull. Denison
Univ., vol. 11, p. 43; COCKERELL, 1898, Bull. Univ. New
Mexico, vol. 1, p. 43; COCKERELL, 1906, Trans. Amer. Ent.

Soc., vol. 32, p. 292; SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 20.

I have examined only one specimen of chamaesarachae and this a female determined by Timberlake from Arizona. This female is apparently not typical, for the first tergum is virtually impunctate, except for fine, lateral punctures. An examination of the apical metasomal sternum fails to reveal anything except a depressed marginal rim rather than the broad apical depression characteristic of the females of the consors group. Further material is essential to the clarification of the status of this species. As I have not seen the type I am obliged to quote the original description as given by Cockerell in 1897.

FEMALE:

"Length about 10 mm., black, with short, dull grey pubescence. Head tolerably broad; eyes not bulging at the top; face and cheeks with sparse grey pubescence; sides of vertex sparsely punctured, shining; a broad dull groove in front of the upper part of each eye; labrum with deep median longitudinal furrow; mandibles stout, rounded at tips, a notch near the end; space between mandible and eye very short; flagellum dark brown beneath from the third joint to the end, its second joint shorter than the third and only half as long as the first. Prothoracic spine rather short, but very slender and sharp. Mesothorax with very large close punctures, absent on the disc. Anterior

half of scutellum impunctate, posterior half with large punctures. Base of metathorax divided by ridges into quadrate spaces which are longer than broad. Lateral faces of posterior truncation irregularly and obscurely reticulate, dullish becoming microscopically lineolate or subreticulate. Pleura closely punctured, subcancellate. Thoracic pubescence short and rather sparse, dull yellowish grey, or, one might say, pale greyish ochreous. Tegulae shining piceous, not noticeably punctured. Wings hyaline, nervures piceous, stigma fuscous. Legs with mouse-colored pubescence; tarsi dark; tibial spurs dark brown; hind spur of hind tibia pectinate, with about fifteen teeth. Inner tooth of claw short diverging from the outer. Abdomen rather narrow, subconical, moderately shiny, punctuation of first segment fine but strong and rather close, of the remaining segments minute and obscure. Base of first segment sparsely hairy; hind margins of segments one to four with bands of whitish pubescence; second segment very feebly pubescent at extreme base. Venter with rather abundant fairly long mouse-grey pubescence."

Cockerell also states, "Hair of thorax with some fuscous hairs intermixed on mesothorax and scutellum; spurs piceous; mesothorax with large, shining impunctate space."

The male is unknown.

Type is unique, taken at Sante Fe, New Mexico, and

according to Swenk (1908) was in the collection of (T. D. A. Cockerell.) The type was taken at the flowers of Chamaesaracha coronopus on August 2. Swenk also states the species lies very close to Colletes crawfordi but remains distinct from this in the opinion of Professor Cockerell. I can hardly agree with Swenk in his designation of chamaesarachae as a member of the latitarsis group, and have temporarily placed it here until further material becomes available. The single specimen available is a female from Baboquivari Mountains, Arizona, August 5, 1924, (O. C. Poling). The determination was made by Timberlake.

The holotype is located in the collection of T.D.A. Cockerell.

Colletes scopiventer Swenk

scopiventer SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 46; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 206-7.

The male described by Swenk in 1908 has proved to be birkmanni Swenk. However, the female is a valid species. The type agrees closely with the specimens taken from Davis Mountains, Texas. The species seems to be distributed along the lower Sonoran region with two specimens from California placed in with the species. The scopa is very long and dense; the clypeus convex with sparse, coarse

punctures; the fascial foviae are very broad and deep extending medially to a point equidistant between the antennal bases and the inner orbital margins.

FEMALE: length 9 mm., wing length 6.5 mm.

Pile of face rather long, dense, and white, particularly about antennal bases and along inner orbital margins; vertex with pile tinged with grey with a few, light ochreous hairs; upper genal areas with pile rather short, sparse, and pale grey, pile becoming longer, sparser, and whiter below, a broad band of appressed, white pubescence immediately posterior to upper portion of the compound eye; mesoscutum with anterior and lateral margins having abundant, short, dense pubescence tinged with pale grey, discal area with black pile intermixed, becoming most predominant on median discal area; scutellum with a dense fringe of short, pale grey pile about lateral and posterior margins, some dark pile intermixed mesad to this peripheral rim; propodeum with a dense fringe of pale grey pile on upper latero-posterior margin, extending part way to pedicle, lateral face with a small amount of very short, white, semi-appressed pubescence, not concealing the surface, posterior face with abundant, long, erect, pale grey pile; pile of anterior two pairs of legs short and white, posterior femora and tibiae with abundant, plumose, long pile tinged with light ochreous; first metasomal tergum with apical fascia broad and pure white, composed of fine, white

pubescence, lateral fringes long and dense anteriorly, becoming very short and sparse towards apical fascia, disc with abundant, erect, white pile, particularly on anterior face; metasomal terga two to five with fasciae broad, very weak, and composed of short, white pubescence; metasomal terga three to five with discal area having very short, sparse, fulvous pubescence; metasomal sterna with posterior one-half of each disc having abundant, long, erect, pale grey to light ochreous pile, forming a rather dense scopa.

Antennae reddish brown, flagellar segments short, five-eighths as long as broad; malar space short, one-eighth as long as broad; clypeus convex and short, coarsely but very sparsely punctate, punctures approximately one to three puncture widths apart, much finer on extreme lateral margins, becoming coarser and tending to be very weakly striate apically; vertex shiny, shallowly and sparsely punctate; fascial foviae deep, broad, extending medially to a point equidistant to distance from antennal bases from inner orbital margin, dorsal end of fascial foviae extending at least three-quarters of the way from inner orbital margins to lateral ocelli. Prothoracic spines short and sharp, at least as long as width across base; mesoscutum rather coarsely and densely punctate, punctures one-half puncture width apart anteriorly to one puncture width apart medially, impunctate area very small to absent; scutellum coarsely punctate posteriorly,

punctures becoming smaller and sparser towards anterior median portion where they tend to be one to two puncture widths apart, punctures not at all striate; mesepisterna deeply and densely punctate, with shiny interspaces, punctures one-half puncture width apart above to one puncture width apart below; propodeum with basal area sloping sharply ventrally, shallowly, quadrately punctate, lateral faces roughened with weak longitudinal rugae, posterior face dull and roughened irregularly; tegulae deep brownish hyaline; wings dusky with abundant, deep fulvous pubescence, particularly apically, nervures brown to dark brown; legs deep brown to black; posterior basitarsi three and three-quarter times as long as broad. First metasomal tergum shiny, impunctate, except for a few, very shallow, sparse follicles, becoming much closer, finer, and more evident laterally; second metasomal tergum dull, very finely and shallowly folliculated, tergum very weakly depressed basally, fasciae lying in weakly depressed, apical margins, fascial margins tending to deep brownish hyaline; metasomal sterna dull, very densely and finely folliculated; last metasomal tergum with apical one-half sharply depressed, shiny, impunctate, and non-plumose, with basal overhanging hair band.

Distribution:

The type was described from a female taken at Fedor in Lee County, Texas, by the Rev. G. Birkmann. Additional

specimens, all females, have been recorded from the following localities:

Texas: Davis Mountains, July 9, 1942, June 27, 1942, June 28, 1942 (E. C. Van Dyke); Chisos Mountains, Big Bend, July 3, 1942 (E. C. Van Dyke); 36 miles south Sonora, April 14, 1950 (Michener, Beamer, Rozen, Stephen); 15 miles north Del Rio, April 11, 1950 (Michener, Beamer, Rozen, Stephen); Van Horne, September 14, 1950 (Michener, Beamer).

Arizona: Tombstone, August 13, 1940 (C. D. Michener).

California: Riverside, September, 1935 (Reeves); Redlands (F. R. Cole).

Plant Records:

Chamaesaracha conioides, Solanum rostratum.

The holotype is located in the collections of the University of Nebraska.

Colletes texanus texanus Cresson

texana CRESSON, 1872, Trans. Amer. Ent. Soc., vol. 4, p. 249; CRESSON, 1916, Mem. Amer. Ent. Soc., vol. 1, p. 109; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 402.

The species was originally described from a female taken in Comal County, Texas, and redescribed by Swenk

in 1908. The redescription of Swenk is apparently based on another species, swenki, described elsewhere in this paper. I have not seen the specimens used by Swenk; however, from the description there can be no doubt as to the misidentification for he described the female as having "malar space very short, one-ninth as long as broad. Prothoracic spine reduced to a mere pointed angulation. Clypeus shiny, convex, not sulcate. Abdomen shining, the first segment polished and subimpunctate." In the type the malar space is one third as long as broad; the prothoracic spine is long and sharp; the clypeus long, flattened, with a distinct longitudinal median sulcus; and the first metasomal tergum closely and deeply punctate. Colletes crawfordi described from Dallas, differs but slightly from the more southerly specimens of texanus; the first metasomal tergum is more closely and deeply punctate in crawfordi and there are fewer dark hairs on the posterior tibiae and basitarsi. C. crawfordi undoubtedly ranks only as subspecifically distinct from texanus. The species superficially resembles intermixtus but is readily distinguished from that by the coarse, close puncturation of the first metasomal tergum in t. texanus.

MALE: length 7.5 mm., wing length 5.25 mm.

Pile of face most dense, longest, and whitest about antennal bases and along inner orbital margins; the clypeus weakly covered with long, white pile; vertex with

pile pale grey and sparse; upper genal areas with upper surfaces having abundant, short, pale grey pubescence, pile becoming much longer and whiter below; mesoscutum with weak admixture of dark to black hairs on discal area, with abundant, short, pale grey pile; scutellum with a rather dense lateral and posterior fringe of pale grey pile, a few darker hairs intermixed; mesepisterna with pile long, sparse, and pale grey pile of legs short, sparse, and pale grey; first metasomal tergum with apical fascia narrow and composed of short, white pubescence, lateral fringes weak and barely reaching apical fascia, discal area with sparse, erect, long, pale grey pile, not at all concealing the surface; metasomal terga two to five with fasciae broader than that of first tergum, pubescence is white and moderately dense; metasomal terga three to five with discal area having abundant, short, deep fulvous to black, erect pile, not at all concealing surface; metasomal sterna two to four with apical fringes of fine, white to pale grey pile.

Antennae short, deep brown to black, flagellar segments barely longer than broad; malar space about as long as broad; clypeus flattened with a very weak, longitudinal median sulcus, surface sparsely punctate with shiny interspaces, punctures most dense and most striate along median longitudinal line, punctures becoming much sparser on latero-apical margins; vertex shiny, very sparsely and shallowly punctate, fascial foviae deeply depressed and

curved at dorsal face to lateral ocelli. Prothoracic spines long and sharp, twice as long as the width across base; mesoscutum coarsely and densely punctate over anterior one-half and lateral faces, punctures one puncture width apart, impunctate area small; scutellum densely and coarsely punctate over posterior two-thirds, punctures no more than one-half puncture width apart, becoming sparser at anterior and antero-medial faces; mesepisterna densely and rather coarsely punctate, punctures almost contiguous above, becoming sparser below; propodeum with basal area rather deeply, quadrately pitted, lateral and posterior faces roughened and dull, covered with many weak rugae; tegulae black; wings slightly dusky with abundant, deep fulvous pubescence, nervures deep brown; legs black; posterior basitarsi four times as long as broad. First metasomal tergum rather densely and coarsely punctate, punctures one to one and a half puncture widths apart, interspaces shiny; second metasomal tergum with punctures finer, almost folliculated, and closer along anterior and median faces; metasomal sterna dull, rather finely and densely folliculated; seventh ventral plates very short and extended laterally, a preapical fringe of long, dense pile extending from the median to lateral faces (See fig. 69).

FEMALE: length 9 mm., wing length 6 mm.

Pile of face short, white, and concentrated principally along lower inner orbital margins and laterad of antennal

bases; vertex with pile sparse and pale grey upper genal areas with pile short, pale grey becoming longer, finer, and whiter below, a weak fringe of appressed, pale grey pubescence immediately posterior to each compound eye; mesoscutum with abundant, black pile on median discal area intermixed with short, pale grey pile of anterior and lateral faces; scutellum with lateral and posterior faces having abundant, intermixed black and pale grey pile; mesepisterna with pile long, fine, and white; propodeum with short fringes of white pile on upper latero-posterior margins, lateral and posterior faces with sparse, erect, whitish pile; pile of anterior two pairs of legs white, pile of posterior femora long, plumose, and tinged with pale grey, posterior tibiae with abundant, short, black pile intermixed with grey on upper surfaces; first metasomal tergum with apical fascia weak, narrow, and white, lateral fringes of pile very short, weak, and not quite reaching apical fascia, disc with anterior face having abundant, short, white pile, erect and not concealing surface; metasomal terga two to four with fasciae broad, weak, and white, often interrupted due to removal of pubescence; metasomal terga three to six with discal areas having abundant, very short, black to deep fuscous pile, pile not concealing surface; metasomal sterna with discs having abundant, long, erect, white pile, forming a strong scopa.

Antennae brown to brownish black; flagellar segment

approximately three-fourths as long as broad; malar space three-eighths as long as broad; clypeus flattened, shiny, a very weak longitudinal median sulcus, most evident on central portion of clypeus, punctures sparse, striate, with broad, shiny interspaces, punctures approximately one to three puncture widths apart, apical and latero-apical margins shiny, sparsely punctate; vertex shiny, virtually impunctate, fascial foviae very deep, expanded slightly medially and with dorsal margins curved medially towards lateral ocelli, reaching over half way to lateral ocelli from inner margin of the compound eye. Prothoracic spines very long and sharp, at least twice as long as width across base; mesoscutum very densely and coarsely punctate, impunctate area small, almost absent; scutellum with punctures very coarse over posterior two-thirds, tending towards striateness at median line; mesepisterna very coarsely, almost contiguously punctate, dull above and shiny below; propodeum with basal area deeply, quadrately pitted, lateral and posterior faces dull and roughened; tegulae deep brown to black; wings feebly dusky with abundant, deep fulvous pubescence, nervures deep brown; legs dark brown to black; posterior basitarsi three and one-half times as long as broad. First metasomal tergum finely and rather densely punctate, punctures one to two puncture widths apart, being much finer at apical and median lines; second metasomal tergum rather densely and coarsely folliculated; metasomal sterna

dull, densely folliculated; last metasomal sternum with apical one-quarter depressed, shiny, and impunctate, with a basal fringe of long, overlapping pile.

Distribution:

Texas: Donna, September 3, 1933 (J. W. Monk); Austin, (A. L. Melander); Progreso, April 12, 1950 (Michener, Rozen, Beamer, Stephen); Brownsville, March 26, 1951 (C. D. Michener); San Benito, March 28, 1951 (R. H. Beamer); Southmost, Cameron County, March 27, 1951 (C. D. Michener).

This is the first record of the male of t. texanus and the specimen from San Benito, March 28, 1951 (R. H. Beamer) has been designated as the neoallotype.

The holotype is located in the Academy of Natural Sciences of Philadelphia.

Colletes texanus crawfordi Swenk

crawfordi SWENK, 1906, Ent. News, vol. 17, p. 257;
SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 20.

This subspecies occurs in the northern and western parts of Texas, having been taken from Dallas and Plano, and west to San Angelo. This is the first record of a male of texanus crawfordi the single male from Dallas, Texas, taken on July 19, is designated as the neoallotype of this subspecies.

MALE:

Smaller in size than typical texanus; mesoscutum and scutellum almost devoid of black pile; fascial foveae more distinctly depressed and only weakly curved toward lateral ocelli; tegulae are light hyaline brown; nervures light brown; first metasomal tergum just appreciably more coarsely and densely punctate.

FEMALE:

Very similar to texanus except in not having black pile on mesoscutum, occasionally a few darker hairs on median discal area; tegulae are brownish hyaline and nervures brown; first metasomal tergum appreciably more densely punctate, punctures very fine as in typical texanus.

Distribution:

Texas: Dallas, October 8, 1905 (A. J. Leister) on Physalis; San Angelo, September 27, (J. C. Crawford) on Physalis; Plano, July 19, (A. J. Leister); Dallas, July 19, (A. J. Leister) (neoallotype).

The holotype and the neoallotype are located in the collection of the University of Nebraska.

This subspecies with texanus texanus apparently has two generations per year or else occurs continuously from March in the south until October in the north.

Colletes swenki Stephen, new species

texanus, SWENK (not CRESSON), 1908, Univ. Nebraska Studies, vol. 1, p. 44.

This may be the species referred to Swenk as texanus. The species is doubtfully placed in the consors group, for the antennal segments of the male are one and one-quarter times as long as wide and in the females there is no distinct depression to the last apical sternum; however there is a narrow, depressed rim. The females closely resemble linsleyi, which does appear to be a member of the consors group. The males have the malar space one-quarter as long as wide, a short, sharp prothoracic spine, sparsely punctate first metasomal tergum, and the second metasomal tergum basally depressed. In the females the malar space is about one-eighth as long as wide, the clypeus closely and coarsely punctate, and the abdominal scopa dense. The mesoscutum and scutellum have black pile and the facial foviae are deep and narrow.

MALE: length 8.5 mm., wing length 6 mm.

Pile of face long and dense, extending well above the antennal bases, pile white; vertex with pile white to pale grey, sparse; upper genal areas with pile pale grey and short, becoming longer and whiter below; mesoscutum with abundant, white to pale grey pile over anterior one-half, discal area with a weak admixture of darker

pile; scutellum with a peripheral rim of long, pale grey pile, with abundant black pile mesad to peripheral rim; mesepisterna with pile long, fine, and white; propodeum with long fringes of white pile on upper latero-posterior margins, lateral and posterior faces with sparse, shorter, white pile; pile of legs sparse, short, and white; first metasomal tergum with a long, dense, white apical fascia, lateral fringes long, white, and dense extending to fascia, discal area with pile long, white, and erect; metasomal terga two to five with fasciae broad and rather weak, with apical margin of tergum protruding beyond limits of the fascia, fascia white; metasomal terga three to six with abundant, pale grey to whitish, erect pubescence on discs; metasomal sterna two to four with weak fringes of long, pale grey pile on apical margins.

Antennae deep brown to black, flagellar segments one and one-quarter times as long as broad; malar space one-quarter as long as wide; clypeus convex and short, very densely and closely punctate, punctures not contiguous and very weakly striated apically; vertex shiny, sparsely punctate. Prothoracic spines very short and sharp, almost vestigial; mesoscutum very densely and coarsely punctate over anterior one-half and lateral margins, impunctate area small; scutellum rather coarsely punctate, punctures of variable denseness, varying from one-half to one puncture width apart on median discal area, punctures much finer, virtually absent on anterior

faces, punctures not at all striate; mesepisterna very densely, contiguously punctate with linear interspaces; propodeum with basal area sloping sharply ventrally, very shallowly, longitudinally, quadrately pitted, lateral and posterior faces roughened and dull; tegulae deep brown; wings dusky with abundant, fulvous pubescence, particularly apically, nervures dark brown; legs deep brown to black; posterior basitarsi four times as long as broad. First metasomal tergum shiny, very finely, shallowly, and sparsely punctate, punctures almost follicle-like and three to five puncture widths apart; second metasomal tergum very finely punctate or coarsely folliculated, follicles three to four follicle widths apart, tergum weakly depressed basally; metasomal sterna dull, very densely, finely folliculated; seventh ventral plates with broad, membranous apical expansions. (See illustration 68).

FEMALE: length 9.5 mm., wing length 6.5 mm.

Pile of face short and dense, particularly about antennal bases and along lower inner orbital margins; a few long, white hairs on clypeus; vertex with pile pale grey particularly in ocellar triangle; genal areas with upper surface having abundant, short, pale grey pile, becoming very long and fine below; mesoscutum with an admixture of white and black pile, black pile concentrated principally on median discal area; scutellum with a narrow fringe of whitish pile about lateral and posterior

margins, abundant black pile on disc; mesepisterna with pile long, fine, white; propodeum with rather dense, long, white fringes of pile at upper margin of latero-posterior face, lateral and posterior faces with sparse, long, white pile; legs with pile long, white to tinged with grey and densely plumose on posterior femora; posterior tibiae with a weak admixture of very short, black pile on upper surface; first metasomal tergum with apical fascia weak, white, occasionally interrupted medially, lateral fringes of pile very weak, barely extending to apical fascia, discal area with sparse, erect, white pile; metasomal terga two to five with fasciae broad and white; metasomal terga three to five with discs having abundant, very short, white, erect pubescence, not concealing surface; metasomal sterna with discs covered with abundant, erect, long pubescence, forming a strong scopa.

Antennae deep brown to black, flagellar segments short, five-eighths as long as broad; malar space short, one-eighth as long as broad to linear; clypeus weakly convex, very densely punctate over entire surface, punctures tending to weak striateness at apex with striae converging to medio-apical margins; vertex shiny, sparsely punctate; fascial foviae deep, weakly broadened medially and extending one-third of way to lateral ocelli. Prothoracic spines short and sharp; mesoscutum very densely and coarsely punctate, punctures no more than one-half puncture width apart on anterior one-half and lateral margin, impunctate

area small; scutellum rather densely and coarsely punctate over posterior two-thirds, punctures not at all striate and becoming weaker to absent on anterior face; mesepisterna very densely and coarsely, almost rugosely, punctate, separated by shiny ridges; propodeum with basal area sloping ventrally and with shallow, linear, quadrate pits, lateral and posterior faces dull and roughened; tegulae deep brown hyaline; wings dusky with abundant, short, fulvous pubescence, particularly on apical portions, nervures dark brown; legs deep brown to black; posterior basitarsi three times as long as broad. First metasomal tergum shiny, very weakly and sparsely folliculated, follicles three to six follicle widths apart; second metasomal tergum shiny with follicles much closer than on first, follicles approximately two to four follicle widths apart; metasomal sterna dull, very densely and finely folliculated, last metasomal sternum with apical one-quarter sharply depressed and shiny with a fringe of long, tawny pile overhanging from apical margins.

Distribution:

Holotype male, allotype female, 12 male and 1 female paratypes: Alfred, Texas, March 29, 1951 (R. H. Beamer and C. D. Michener) on Acacia greggi; additional paratypes: 6 males, Southmost, Cameron County, Texas, March 27, 1951 (R. H. Beamer and C. D. Michener) on Coreopsis douglasii; 2 males, 1 female, Albany, Texas, April 9, 1950 (Beamer,

Stephen, Michener, Rozen) on Rhus microphyllia; 3 males, Quemada, Texas, April 14, 1949 (Michener and Beamer); 2 males, Austin, Texas, April 12, 1902 (A. L. Melander); 1 female 23 miles south Del Rio, Texas, April 11, 1950 (Michener, Rozen, Beamer, Stephen) on Prosopis glandulosa; 1 female, Corrizo Springs, Texas, April 14, 1950 (Michener, and Beamer); 1 female, 9 miles northwest Corrizo Springs, Texas, April 11, 1950 (Michener, Rozen, Beamer, Stephen) on Chamaesaracha conicoides; 1 female; Hidalgo County, Texas, February 15, 1930; 1 female, Kerrville, Texas, April 14, 1907 (F. Durham) on Marrubium vulgare; 1 female, Tombstone, Texas, March 29, 1951 (L. D. Beamer); 1 female, San Antonio, Texas, February 28 (S. C. Pratt).

Other material not included in the type series; 1 male, Meade County State Park, Kansas, June 7, 1950 (H. O. Wright); 1 male, Johnson County, Kansas, June 16, 1949 (Michener and Beamer) on Quincula lobata.

The holotype and allotype will be placed in the Snow Entomological Collections of the University of Kansas.

Colletes linsleyi Timberlake

linsleyi TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 205.

This is a monotypic species described by Timberlake

from a female taken at Blythe, California. It is recognizable as a member of the consors group in having the last metasomal sternum with the apical portion sharply depressed. The female closely resembles those of the swenki Stephen, but has the first metasomal tergum densely folliculated and the fascial foviae much broader.

FEMALE: length 8 mm., wing length 5 mm.

File of face short, sparse, and white, most dense along inner orbital margins; vertex with pile light grey and sparse; upper genal areas with short, light grey pile, becoming whiter, longer, and finer below, a weak rim of semi-appressed white pubescence posterior to each compound eye; mesoscutum and scutellum with mixture of white, dusky and black pile, black pile principally on median discal areas; mesepisterna with pile sparse, fine, and white; propodeum with long fringes of grey pile on latero-posterior margins, extending down to pedicle, posterior face with abundant, erect, light grey pile; pile of legs long, plumose, and tinged with ochreus except on posterior tibiae where there is abundant, short, black pile; first metasomal tergum with weak fascia of short, white pubescence, fasciae interrupted medially, lateral fringes absent, a few long, erect, white hairs on extreme anterior face of disc; fasciae of metasomal terga two to four weak, composed of short, white pubescence, often interrupted medially; metasomal terga two to five having abundant, very short, dark black, erect pubescence on discal areas;

metasomal sterna with abundant, erect, fulvous pubescence over each disc, forming a weak scopa.

Antennae reddish brown, flagellar segments one-half as long as broad; malar space linear; clypeus weakly and uniformly convex, very densely punctate with weakly rugose punctures, punctures becoming much more striate at latero-apical margins; vertex shiny, finely and rather densely punctate; fascial foviae very deep, broadened medially and extending well up beyond dorsal to inner orbital margin, extending almost half way to lateral ocelli. Prothoracic spines blunt and vestigial; mesoscutum densely, contiguously punctate over anterior one-half and lateral margins, impunctate area small; scutellum coarsely and densely punctate over posterior three-quarters, anterior median area shiny, impunctate; mesepisterna dull, closely and densely punctate with coarse punctures; propodeum with basal area sloping sharply posteriorly, very shallowly, quadrately pitted, lateral and posterior faces dull and roughened; tegulae deep brown hyaline; wings dusky, very densely covered with short, fulvous pubescence, nervures deep brown; legs deep reddish brown; posterior basitarsi three and one-half times as long as broad. First metasomal tergum shiny, very densely and finely folliculated over entire surface, follicles almost appearing as a weak roughness to the surface; metasomal terga two and three similarly finely and very densely folliculated, dull; metasomal sterna dull, densely, rather coarsely

folliculated; last metasomal sternum with apical one-quarter depressed, shiny, and non-plumose, with a basal fringe of long, overhanging, fulvous pile.

Distribution:

California: Blythe, Riverside County, May 7, 1947, on Tamarix (E. G. Linsley) (holotype located at the Citrus Experiment Station, Riverside, California).

Colletes peninsularis Timberlake

peninsularis TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 203.

It would appear that this monotypic species is a member of the consors group rather than related to C. perileucus as Timberlake suggests. The antennae of the female are shorter than those of perileucus; the clypeus is short, convex, and densely, rather rugosely punctate; and the last metasomal sternum has the apical one-fourth strongly depressed.

FEMALE: length 9 mm., wing length 6 mm.

File of face white and dense along lower inner orbital margins and below antennal bases, a few long, pale grey hairs overhanging clypeus from lateral margins; vertex with pile sparse and short, pale grey with a few darker hairs; genal areas with short, sparse, pale grey pile

above, pile becoming longer, finer, and whiter below, a rather dense mat of appressed, white pubescence immediately posterior to each compound eye; mesoscutum with a strong admixture of pale grey and black pile, black pile becoming most dense over median discal area; scutellum with a fringe of grey to tinged with ochreous pile about peripheral margins, abundant, long, black pile medially; mesepisterna with pile long, fine, and white; propodeum with rather narrow, long fringes of whitish pile on dorsal portion of latero-posterior margins, extending weakly to pedicle, posterior face with abundant, erect, fine pile; pile of legs long, rather dense, and grey, weakly tinged with ochreous on posterior femora and tibiae; first metasomal tergum with a narrow, white apical fascia, interrupted medially, lateral fringes of light grey pile very weak, almost absent, disc with a few fine, pale grey hairs, not at all concealing surface; metasomal terga two to five with fasciae broad, weak, and pure white; pubescence often removed on portions; metasomal terga four and five with discs having very short, fine, deep fulvous to brown, erect pile, not at all concealing surface; metasomal sterna having discs weakly covered with short, tawny, erect pile, most evident on metasomal sterna two and three, forming a very weak fascia.

Antennae deep reddish brown, short, flagellar segments one-half to five-eighths as long as broad; malar space linear; clypeus convex and short, rather coarsely and

deeply punctate, punctures tending to be somewhat striate with shiny interspaces; vertex shiny, shallowly and rather sparsely punctate with shiny interspaces, fascial foviae very deep and narrow, extending above the inner orbital margins but one-quarter of way to lateral ocelli. Prothoracic spines very short and sharp; mesoscutum rather densely and coarsely punctate over anterior one-half and lateral margins, impunctate area large; scutellum coarsely punctate over posterior two-thirds, with shiny interspaces, punctures becoming sparser and slightly smaller anteriorly, not at all striate; mesepisterna densely, coarsely punctate, punctures no more than one-half puncture width apart with shiny, linear interspaces; propodeum with basal area very shallowly, longitudinally, quadrately pitted, lateral and posterior faces dull and weakly, finely roughened; legs deep brown; posterior basitarsi three and one-half times as long as broad. First metasomal tergum shiny, very finely folliculated, particularly on lateral faces; second metasomal tergum dull, finely and densely folliculated, metasomal fasciae lying in shiny, impunctate, apical rims; metasomal sterna dull, finely and densely folliculated; last metasomal tergum with apical one-third distinctly depressed and shiny with a basal fringe of overhanging hairs.

Distribution:

Holotype, female, Coyote Cove, Concepcion Bay, Baja California, October 1, 1941 (Ross and Bohart). The

type is in the collection of the California Academy of Sciences.

GROUP XIV - intermixtus

Colletes intermixtus Swenk

intermixtus SWENK, 1905, Canadian Ent., vol. 37, p. 302;
SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 42;
COCKERELL, 1917, J. New York Ent. Soc., vol. 25, p. 189;
TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81,
p. 399; TIMBERLAKE, 1951, Wassman J. Biol., vol. 9, p. 207.

lippiarum COCKERELL, 1909, Canadian Ent., vol. 41, p.
394; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81,
p. 399.

This species is not uncommon in the lower Sonoran zone of America from Texas to California and occurs to a lesser degree in western Colorado. Both sexes have the clypeus long and flattened, with a distinct longitudinal median sulcus; the antennae, while not as short as in the typical members of the consors group, are shorter than representatives of other groups. The species is placed here provisionally for the antennae of the males are long and the female lacks the apical depression of the last metasomal sternum, which is common to all other members of this group. The males have the malar space about

two-thirds as long as wide; black pile on the mesoscutum and the scutellum, and an impunctate first metasomal tergum; the seventh ventral plates are rather distinctive, as illustrated. The females also have the first metasomal tergum impunctate, and have abundant black pile on the inner orbital margins, the clypeus, genal areas, as well as the thoracic dorsum; the malar space is approximately one-third as long as wide, and the ocular areas are deep and elongate.

MALE: length 10 mm., wing length 6.75 mm.

Pile of face long and dense, particularly about antennal bases and inner orbital margins; clypeus only weakly concealed by overhanging, white pile; vertex with pile long, sparse, and pale grey; upper genal areas with pile long and tinged with pale grey, becoming longer, denser, and whiter below; mesoscutum with pile predominantly long, fine, and pale grey, a few black hairs intermixed on median discal area; scutellum with a weak lateral and posterior fringe of long, pale grey pile, abundant black pile mesad to this peripheral rim; mesepisterna with pile long, fine, and white; propodeum with long fringes of white pile along upper latero-posterior margins; pile of legs sparse, pale grey and fine; first metasomal tergum with apical fascia narrow, dense, and white, weak lateral fringes of white pile barely reaching apical fascia, discal area with abundant, erect, whitish pile, not concealing surface; metasomal terga two to five with fasciae rather narrow and

dense, narrowed laterally, white; metasomal terga three to six with abundant, erect, deep fulvous to black pile on discs; metasomal sterna with lateral fringes of long, light ochreous pile, broadly interrupted medially.

Antennae deep brown to black, flagellar segments approximately one and one-quarter times as long as broad; malar space about one-half as long as broad; clypeus weakly convex with a deep longitudinal median sulcus extending from base to apex, clypeus rather sparsely and coarsely punctate, with shiny interspaces, apical and latero-apical faces shiny and very sparsely punctate; vertex shiny, finely and sparsely punctate. Prothoracic spines very short, vestigial; mesoscutum densely punctate over anterior and lateral margins, impunctate area small; scutellum rather finely and densely punctate over posterior one-half, punctures fine, sparse, to absent on anterior one-half; mesepisterna distinctly punctate with shiny interspaces, punctures one-half puncture width apart; propodeum with basal area shallowly, quadrately punctate, lateral and posterior faces shiny and sharply punctate, punctures one to four puncture widths apart; tegulae black; wings dusky with abundant, fine, fulvous pubescence; nervures deep brown; legs black; posterior tibiae greatly expanded on median anterior margins, almost bulbous; posterior basitarsi two and one-half times as long as broad. First metasomal tergum very finely and sparsely punctate, almost folliculated, interspaces shiny and tinged with a metallic blue lustre;

second metasomal tergum black, rather densely folliculated; metasomal sterna dull, apical metasomal sternum winged weakly on latero-apical margins; seventh ventral plates roughly triangular with lateral and median margins reflexed, apical margin weakly emarginate and dense clumps of pile at each of reflexed apical and median margins (See fig. 70).

FEMALE: length 9.5 mm., wing length 6.5 mm.

Pile of face long and white about antennal bases and along inner orbital margins, a few darker hairs intermixed along lower inner orbital margins; vertex with a few dark hairs amongst fine, long, fulvous pile; upper occiput with pile short and tinged to pale grey, pile becoming much longer and whiter below, weak, appressed rim of white pubescence immediately posterior to each compound eye; mesoscutum with pile predominantly pale grey but with a strong admixture of black pile on discal area; scutellum with a mixture of pale grey and black pile about lateral and posterior margins; mesepisterna with pile long, fine, and white; propodeum with long fringes of white pile on upper latero-posterior margins, occasionally a few black hairs intermixed on extreme upper face; legs with pile long, rather dense, and tinged with ochreous, a number of short, black hairs on upper surface of posterior tibiae; first metasomal tergum with a very narrow, yet dense fringe of white pubescence on apical

margin, a weak fringe of white pile almost reaching the apical fascia, disc with abundant, fine, erect, white pile; metasomal terga two to four with fasciae broad, rather weak, and pure white, discal area with abundant, very short, fine, erect, black pile; metasomal sterna with discs having abundant, erect, white to pale grey pile on discs, forming a very weak scopa.

Antennae brown to black, flagellar segments five-eighths as long as broad; malar space one-third as long as broad; clypeus weakly convex with a deep longitudinal median sulcus, surface coarsely and sparsely, striately punctate, punctures densest along longitudinal median sulcus, tending to be two to five puncture widths apart on lateral faces, interspaces shiny; vertex shiny, impunctate; fascial foviae expanded medially, deeply depressed and bluntly rounded dorsally, dorsal margin not extending half way to lateral ocelli. Prothoracic spines roughly triangular, approximately as long as width across base; mesoscutum very densely and coarsely punctate about anterior and lateral faces, impunctate area very small; scutellum distinctly punctate over posterior one-half, not striately punctate, punctures becoming very sparse on anterior one-half; mesepisterna deeply and densely punctate, with shiny interspaces, punctures one-half puncture width apart; propodeum with basal area shallowly, quadrately pitted, lateral and posterior faces dull sharply punctate, punctures two to four puncture widths apart; tegulae deep brown to black; wings dusky with abundant, short, fulvous

pubescence, nervures dark brown; legs deep brown to black; posterior basitarsi three times as long as broad. First metasomal tergum moderately shiny and very finely folliculated, surface with a weak, metallic blue lustre; second metasomal tergum dull, very finely and densely folliculated; metasomal sterna dull, densely folliculated.

Distribution:

Texas: 36 miles south of Sonora; San Benito; 47 miles west of Sheffield; San Antonio; Bexar County; Dimmit County; Fedor, Lee County; Cotulla; Goliad County; Austin; Southmost, Cameron County; Big Bend; Chisos Mountains, Big Bend National Park; Ben Bolt; Kerrville.

Colorado: Grand Junction.

California: Riverside; Redlands; Imperial County; Wood Lake, Tulare County; The Colorado Desert; Colton; Lindsay.

Arizona: Oak Creek Canyon.

Timberlake also records the species (as lippiarum) from Lacueva, Organ Mountains, New Mexico. I have not seen any material from that state but the species undoubtedly occurs there.

Flight Records:

The species has been recorded from March 28 in southern Texas to September 20 in southern California. The collected material would indicate the species flies throughout the

summer, having been taken in every month from March until September in both Texas and California

Plant Records:

Cotoneaster, Ericamera palmeri, Eriogonum fasciculatum,
Gnaphalium beneolens, Gutierrezia, Monarda citriodora,
Physalis, Schinus molle, Solanum douglasii.

Swenk states the species visits the flowers of Acacia farnesiana and Cockerell records it as being on Koeberlinia spinosa and Lippia wrightii.

The holotype is located in the collections of the University of Nebraska.

Colletes bulbotibialis Stephen, new species

This monotypic species closely resembles C. intermixtus Swenk but can readily be distinguished from the latter by the absence of black pile on the mesoscutum and scutellum. A distinctive feature of C. bulbotibialis is the bulbous form of the tibiae, particularly the hind pair which are broadly distended medially and constricted basally and apically. The posterior basitarsi are peculiar in being longitudinally curved.

MALE: length 8 mm., wing length 5.5 mm.

Pile of face long, white, and moderately dense about antennal bases and along lower inner orbital margins, a few long, pale grey hairs overhanging clypeus from

clypeo-frontal margin; clypeus with a few sparse, pale grey to white hairs, particularly along median discal area, pile not at all concealing surface; vertex with a sparse covering of erect, pale grey pile, genal areas with pile short, fine, and pale grey, becoming much longer and whiter below; mesoscutum with abundant, long, fine, pale grey to dusky pile over entire surface, pile sparse and not concealing surface, mesoscutum with a dense fringe of long, tawny-dusky pile about lateral and posterior margins, with a few hairs overhanging median discal area; mesepisterna with pile long, fine, and white; propodeum with long fringes of white pile along latero-posterior margin, fringes most dense and longest on dorsal margins, lateral and posterior face with a sparse covering of erect, whitish pile, a few short, appressed hairs on the lateral faces; pile of legs long, fine, white to pale grey, and sparse; first metasomal tergum with a narrow apical fascia of white pubescence, lateral fringes of white pile extending to apical fascia, disc with a sparse covering of erect, whitish pile, particularly over anterior surfaces; metasomal terga two to five with fasciae broad, weak, and white, fasciae of terga two and three weakly interrupted medially; metasomal terga three to six with discs having an intermixture of short, dark, and long, pale grey pile; metasomal sterna one to three with weak apical fringes of pale grey to dusky pile, sterna four and five with fringes most evident as lateral tufts of dusky pile.

Antennae long, deep brown to black, flagellar segments one and one-quarter times as long as broad; malar space three-quarters as long as broad; clypeus long with a distinct median longitudinal sulcus, surface sparsely and finely punctate, tending to be very weakly striate apically, punctures most dense along median sulcus, lateral rims with punctures two to three puncture widths apart, with broad, shiny interspaces; vertex sharply punctate with shiny interspaces, punctures one to three puncture widths apart. Prothoracic spines absent; mesoscutum densely and coarsely punctate over anterior and lateral margins, punctures no more than one-half puncture width apart, impunctate area small; scutellum shallowly and rather obscurely punctate about lateral and posterior margins, punctures becoming much finer and smaller over median discal area where they are one to two puncture widths apart; mesepisterna densely and coarsely punctate, punctures almost contiguous above to one-half puncture width apart below; propodeum with basal area broad with numerous longitudinal quadrate pits, lateral and posterior faces shiny, weakly roughened, and obscurely punctate; tegulae black; wings dusky with abundant, deep fulvous pubescence, nervures dark brown; legs dark brown to black, tibiae bulbous towards medio-apical extremity, base and apex sharply constricted; posterior basitarsi short and weakly curved, three and one-half times as long as broad. First metasomal tergum finely punctate, punctures one to three puncture widths apart, being most sparse

medially; second metasomal tergum finely and densely punctate, punctures approximately one puncture width apart, second metasomal tergum weakly depressed basally and apically, depressions most evident laterally; metasomal sterna shiny, finely and sparsely folliculated; last metasomal sternum shallowly concave, concavity longitudinally bisected by a weak median elevated rim; seventh ventral plates transverse with apical margins broadly arcuate (See fig. 71).

Holotype, male, Belen, New Mexico, August 19, 1927
(P. A. Readio).

The type is located in the Snow Entomological Collections of the University of Kansas.

GROUP XV - ciliatus

Colletes ciliatus Patton

ciliata PATTON, 1879, Vull. U. S. Geol. and Geog. Survey, series 5, no. 3, p. 369.

speciosa ROBERTSON, 1891, Trans. Amer. Ent. Soc., vol. 18, p. 62; ROBERTSON, 1904, Canadian Ent., vol. 36, p. 275; ROBERTSON, 1928, Flowers and Insects p. 10; (new synonymy).

brevihirtus TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 395; (new synonymy).

Although the loss of the Patton types makes positive verification impossible, I believe that the better known speciosus Robertson is the same as ciliatus Patton. After a critical examination of the original description, the flight period and locale, it is not possible to confuse this for any other species. The description of brevihirtus Timberlake agrees closely with the male of ciliatus, a synonymy which has been verified by Mr. Timberlake upon the examination of the male of speciosus.

The species is closely related to beamerorum, and is characterized by the very small preapical ventral wing to the penis valve in the male, by the very short malar space and by the weakly convex and densely punctate clypeus in both sexes.

C. ciliatus is sparsely distributed over America east of the Rocky Mountains from Colorado to Virginia, and this paper includes the first published record of the male of the species, although one has been designated in the Swenk collection.

MALE: length 10 mm., wing length 6.5 mm.

Pile of face very dense, short, and completely concealing clypeal area, sub- and supra-antennal areas up

to median ocellus, pile strongly tinged with ochreus; vertex with pile concentrated principally in ocellar triangle, strongly tinged with ochreus; genal areas with upper surface having abundant, long, erect, light ochreus pile, pile becoming finer, longer, and whiter below; mesoscutum with abundant, short, erect, light ochreus pile; scutellum with a very broad lateral and posterior band of ochreus pile; mesepisterna with upper half having pile tinged with ochreus, pile much whiter, longer, and finer on lower surfaces; propodeum with long fringes of light ochreus pile on upper latero-posterior margins, lateral and posterior faces with sparse, erect, light ochreus pile; legs with pile short, sparse, and pale grey, femora with longer fringes of plumose, pale grey pile; first metasomal tergum with apical fascia narrow, rather weak, and tinged with yellow, lateral fringes very weak, barely reaching apical fascia, disc with abundant, short, erect, grey to light ochreus pile on the extreme anterior face, median discal area with pile very short and fine, virtually invisible except when viewed laterally; metasomal terga two to five with fasciae narrow, weak, and lightly tinged with light ochreus; metasomal terga five and six with a very sparse covering of short, deep fuscous pile; metasomal sterna two to four with weak fringes of long, pale grey pile.

Antennae reddish brown to deep brown, flagellar segments one and one-quarter times as long as broad; malar space

very narrow, one-quarter as long as broad; clypeus weakly convex, very densely and finely punctate over entire surface, dull; vertex finely and densely punctate, dull. Prothoracic spines absent; mesoscutum densely, finely, and shallowly punctate over the anterior, lateral, and posterior margins, impunctate area absent; scutellum with discal area finely, shallowly punctate, with shiny interspaces, punctures one-half to one puncture width apart, extreme anterior face shiny, impunctate; mesepisterna dull, very closely, finely, shallowly punctate, punctures no more than one-half puncture width apart; propodeum with basal area narrow, shallowly, quadrately pitted, lateral and posterior faces dull; tegulae light hyaline brown; wings dusky with abundant, very deep fulvous pubescence, particularly on apical half, nervures brown; legs brown to black, tarsi tending to be light brown; posterior basitarsi four times as long as broad. First metasomal tergum very finely and densely punctate, with interspaces rather dull, punctures approximately one puncture width apart; second metasomal tergum punctured much as first, only with punctures still more follicle-like, surface dull; metasomal sterna dull, finely folliculated; seventh ventral plates much as in texanus, however being almost completely semi-circular, rather densely covered with deep brown pubescence.

FEMALE: length 11 mm., wing length 7 mm.

Pile of face short and dense along inner orbital

margins and in supra-antennal areas; a very weak covering of short, white pile on slypeus, pile tinged weakly with light yellow; vertex with pile long and tinged with light ochreus, particularly in ocellar triangle; upper genal areas with pile dense, long, and tinged with yellowish, pile becoming much longer, finer, and whiter below, a very narrow rim of appressed, whitish pubescence immediately posterior to each compound eye; mesoscutum with abundant, erect, short, light ochreus pile; scutellum with a broad fringe of short, light ochreus pile about lateral and posterior faces; mesepisterna with abundant, long, fine pile, pale grey to dusky above, becoming pure white below; propodeum with dense fringes of long, light ochreus pile along latero-posterior margins, being most dense dorsally, lateral and posterior faces sparsely covered with long, erect, pale grey pile; pile of legs longest on femoral fringes, white pile on anterior two pairs of legs, pile much longer and exceedingly plumose on posterior femora and tibiae, where it is also tinged with light yellow; first metasomal tergum with apical fascia narrow and white, often interrupted medially, lateral fringes of very short, white pile, barely reaching the apical fascia, extreme anterior face of disc with sparse, very short, whitish pile; metasomal terga two to five with fasciae broader, weak, and white; metasomal tergum five with disc having a weak covering of erect, deep fuscous to dark brown pile; metasomal sterna virtually bare except for a few, erect, light hairs.

Antennae brown, flagellar segments about as long as broad; malar space one-eighth as long as broad; clypeus short, weakly convex, very densely and finely punctate to apex; vertex finely and densely punctate, dull; fascial foviae weakly depressed extending medially two-fifths of way from inner orbital margins to lateral ocelli.

Prothoracic spines absent; mesoscutum very densely, almost contiguously punctate about anterior, lateral, and posterior margins, impunctate area absent, median discal area with punctures sparser and more sharply delineated; scutellum very densely contiguously punctate about lateral and posterior margins, discal area having punctures more apparent but very shallow and close, usually less than one-half puncture width apart; mesepisterna dull, very finely and densely punctate and contiguous over upper surfaces; propodeum with basal area very narrow, shallowly, quadrately pitted, lateral and posterior faces dull; tegulae light hyaline; wings dusky with abundant, short, fulvous pubescence, nervures light brown; legs brown; posterior basitarsi 3.8 times as long as broad. First metasomal tergum very finely and densely punctate, punctures no more than one puncture width apart; second metasomal tergum punctured much as first, with punctures finer, surfaces dull; metasomal sterna shiny, very finely roughened with a few, coarser follicles on apical half of each sternum.

Distribution:

Douglas County, Kansas, August 25, 1949 (Michener, Beamer) on Cuscuta (neoholotype, neoallotype and four females); Lincoln, Nebraska, August ; Sioux City, Iowa, April 19, (C. N. Ainslie); Carlinville, Illinois; and Alexandria, Virginia, September 9, 1928 (C. E. Mickel).

I have not seen the holotype male of Colletes brevihirtus Timberlake, however, this was taken from Wray, Colorado, 3700 feet, August 17-19, 1919, and is at present in the collection of the American Museum of Natural History.

The neotypes are located in the Snow Entomological Collections of the University of Kansas.

Colletes beamerorum new species

This species, of which only the males are known, has the antennal segments one and one-quarter times as long as broad and no dorsal convolutions to the penis valves; otherwise, on the basis of the seventh ventral plate, it closely resembles texanus and its relatives of the consors group. It is arbitrarily placed here until the female is collected, which may then clarify the position.

The clypeus is convex and densely punctate, much as the females of linsleyi and the males of swenki. The malar space is short, one-quarter as long as broad. The first metasomal tergum is densely punctate with punctures one to

two puncture widths apart. There is no dark pile on the body.

MALE: length 9 mm., wing length 6 mm.

Pile of face dense, completely concealing clypeus and antennal bases, tinged with light yellow; vertex with pile tinged with light ochreus, concentrated principally in ocellar triangle; upper genal areas with pile short and tinged with yellow, becoming longer, finer, and whiter below; mesoscutum with pile dense, rather short, and tinged with light ochreus; scutellum with a dense lateral and posterior fringe of ochreus pile, a few deeper ochreus hairs intermixed towards median discal surface; mesepisterna with pile tinged with light yellow above, becoming pure white below, pile fine, long, and weakly plumose; propodeum with rather long fringes of dense, light ochreus pile, particularly on dorsal latero-posterior margins, however extending down latero-posterior margins toward pedicle, lateral and posterior faces with sparse, erect, pale grey pile; pile of legs sparse, weak, and white, most dense as fringes of white pile to femora; first metasomal tergum with apical fascia rather broad and dusky, often interrupted weakly medially, lateral fringes of long, dusky pile extending to apical fascia, disc with sparse covering of erect, tawny pile; metasomal terga two to five with fasciae broad, weak, and pale grey; metasomal sterna two to five with long fringes of dusky pile on extreme apical margins.

Antennae long, brown to brownish black, flagellar segments one and one-quarter times as long as broad; malar space one-quarter as long as broad; clypeus convex and short, finely and densely punctate over entire surface, punctures becoming weakly striate on the lateral and latero-apical margins with very narrow, linear interspaces; vertex densely punctate, dull, with narrow interspaces. Prothoracic spines very short and sharp; mesoscutum densely punctate over anterior and lateral margins, punctures becoming sparser and slightly larger toward median discal area where they tend to be one to two puncture widths apart, impunctate area small; scutellum with posterior one-half rather densely punctate, punctures becoming sparser and shallower on anterior one-half, anterior one-third shiny, impunctate; mesepisterna densely and coarsely punctate, interspaces linear and shiny, punctures no more than one-half puncture width apart; propodeum with basal area narrow and broadly, quadrately pitted, lateral and posterior faces shiny, rugose along latero-posterior margin with lateral and posterior faces irregularly punctate; tegulae deep brownish hyaline; wings dusky with abundant, deep fulvous pubescence, particularly on apical two-thirds; legs deep brown to black; posterior basitarsi four times as long as broad. First metasomal tergum very densely punctate with narrow, shiny interspaces, punctures one-half puncture width apart, being slightly sparser medially and anteriorly; second metasomal tergum punctured much as first, only with punctures appearing more follicle-like and just

appreciably denser; metasomal sterna shiny, rather finely and moderately densely folliculated; seventh ventral plates roughly semi-lunar in shape and similar to those of texanus, however differing in pubescent covering, penis valves with no dorsal convolution, otherwise resembling texanus.

Distribution:

Holotype male and 20 male paratypes: Cararina, Texas, April 11, 1950 (Michener, Rozen, Beamer, Stephen) on flowers of Menarda punctata coryi; one male paratype, Brownsville, Texas, October 16, 1908 (Mitchell and Bishopp); 2 male paratypes, Juarez, Mexico, August 26 (T. D. A. Cockerell).

The holotype is located in the Snow Entomological Collection of the University of Kansas.

Colletes ciliatoides Stephen, new species

This is a sibling species of C. ciliatus Patton but readily be distinguished from that species in having a long prothoracic spine, approximately one and one-quarter times as long as the width across the base, and in the distinctive features of the genitalia. The seventh ventral plate of this species is longer than broad and is indistinctly bilobate with the lateral lobe much smaller than in ciliatus and incomplete; the penis valves have a

narrow ventral membranous margin, which is completely absent in ciliatus. The body of this species is very closely and coarsely punctate with the punctures contiguous to one-half puncture width apart on the mesoscutum, mesepisterna, and first metasomal tergum.

MALE: length 9.5 mm., wing length 6.5 mm.

Pile of face long, dense, and completely concealing clypeus and antennal basal regions as far as median ocellus, pile pale grey becoming progressively more tinged with yellow towards dorsal surface; vertex with pile tinged with light ochreus, concentrated principally in ocellar triangle; genal areas with pile dusky above, becoming much longer, finer, and whiter below, a narrow rim of appressed, white pubescence immediately posterior to each compound eye; scutellum with a dense covering of fulvous to light ochreus pile; scutellum with a lateral and posterior rim of long, dusky to light ochreus pile with a few longer hairs overhanging and partially concealing median discal area; mesepisterna with pile long, fine, and pale grey; propodeum with long fringes of light ochreus pile along latero-posterior margins, fringes most dense and longest on dorsal surface, lateral faces with a weak covering of short, appressed pubescence partially obscuring surface, posterior face with a sparse covering of long, erect, dusky pile; pile of legs short and sparse except on femora which have longer fringes of white pile; first metasomal tergum with a broad fascia of

pale grey pubescence, lateral fringes of pile tinged with yellowish extending to apical fascia, disc with abundant, long, dusky pile, particularly on anterior face; metasomal terga two to five with fasciae broad, weak, and tawny; metasomal terga four to six having the discs with abundant, short, erect, black pile; metasomal sterna one to five with weak apical fringes of dusky pile.

Antennae long, brown to deep brown, flagellar segments one and one-quarter times as long as broad; malar space three-eighths as long as broad; clypeus weakly convex, very finely and densely punctate to apical margins; vertex shiny, finely punctate with shiny interspaces. Prothoracic spines long and sharp, approximately one and one-half times as long as width across base; mesoscutum coarsely and densely punctate, punctures no more than one-half puncture width apart about anterior one-half and lateral margins, impunctate area very small; scutellum densely, contiguously punctate about lateral and posterior margins, punctures becoming very coarse with shiny interspaces on posterior portion of discal area, extreme anterior margin shiny, impunctate; mesepisterna coarsely and densely punctate, punctures contiguous above to one-half puncture width apart below; propodeum with basal area shallowly, quadrately pitted, lateral and posterior faces shiny and irregularly punctate, punctures closest on upper lateral margins, becoming very sparse on posterior face; tegulae light brownish hyaline; wings dusky with abundant, deep fuscous pubescence over

surface, nervures dark brown; legs brownish black basally, grading to light brown apically; posterior basitarsi four and one-half times as long as broad. First metasomal tergum densely and rather coarsely punctate, punctures no more than one-half puncture width apart laterally, tending to become somewhat finer and sparser toward median and anterior faces where they may be one puncture width apart; second metasomal tergum densely and finely punctate with punctures no more than one puncture width apart, punctures much finer than those of first tergum, tergum with an abrupt basal depression; metasomal sterna shiny, finely and sparsely folliculated, particularly on apical one-half of each segment; last metasomal tergum with apex broadly rounded; seventh ventral plates longer than broad, weakly bilobate with lateral lobe rudimentary and short, median and lateral margins strongly reflexed, roughly resembling plates of C. thoracicus; penis valves with a narrow ventral membranous rims.

Distribution:

Holotype, male, and two paratypes, male, Delta, Utah, August 5, 1948 (G. E. Bohart) taken on dodder.

The type of this species is located in the collections the United States National Museum.

GROUP XVI - daleae

Colletes daleae Cockerell

daleae COCKERELL, 1897, Ann. Mag. Nat. Hist., ser. 6, vol. 19, p. 43; COCKERELL, 1897, Bull. Univ. New Mexico, vol. 24, p. 24; COCKERELL, 1898, Bull. Denison Univ., vol. 11, p. 42; COCKERELL, 1898, Bull. Univ. New Mexico, vol. 1, p. 42; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 292; COCKERELL, 1924, Proc. California Acad. Sci., ser. 4, vol. 12, p. 531 and 536; COCKERELL, 1925, Proc. California Acad. Sci., ser. 4, vol. 14, p. 186; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 235.

The species ranks in size with prosopidis but is usually slightly larger. The males are difficult to distinguish from salicicola but can usually be separated in having the malar space approximately one and one-half times as long as wide, and in having the flagellar segments about one and one-third times as long as wide. The metasomal terga are strongly tinged with blue giving a distinct metallic blue lustre. The seventh ventral plate is distinctive in having short lateral fringes of pile, as well as a clump of pile arising at the upper surface immediately beneath the articulatory condyle. The mesepisterna are usually shallowly or obscurely punctate, however in some of the more northerly specimens the punctation becomes rather distinct. The females may also be difficult

to separate from salicicola but are slightly shorter and have the disc of the sixth metasomal tergum with deep ferruginous to dark brown pile. The species can be separated from deserticola in being much shorter and having a longer malar space.

MALE: length 6.5 mm., wing length 5 mm.

Hair of face long, dense, and pure white completely concealing clypeus, lower inner orbital margins with little appressed pubescence; ocellar triangle and vertex with a few pale grey hairs; upper genal areas sparsely pilose with pale grey pile becoming pure white, and much denser on lower and posterior surfaces, a broad rim of appressed pubescence immediately posterior to compound eyes; mesoscutum with sparse covering of light ochreous to pale grey pile not concealing surface; scutellum with long, weakly plumose pile about lateral and posterior edges; metanotum sparsely covered with a few long, erect hairs; posterior lobe of pronotum with a clump of sparse, white pile; mesepisterna sparsely pilose with pale grey to white pile; propodeum with a weak fringe of white pile on dorso-lateral edge, lateral and posterior faces sparsely covered with long, erect pile; legs with short, sparse, white pile; first metasomal tergum sparsely covered with fine, pale grey pile, lateral fringes weak to absent, discernible if viewed dorsally; apical fasciae broad and white, first metasomal fascia narrowed slightly medially; metasomal terga four and five having discs covered with

short, sparse, light golden pile; sternal fascia weak and white.

Antennae short, deep reddish brown, flagellar segments about one and one-third times as long as wide; malar space one and one-half times as long as wide; clypeus strongly protuberant with a distinct longitudinal median sulcus which is broadened apically, sulcus finely and densely punctate, lateral rims of sulcus shiny with a few scattered, coarse punctures, extreme base and lateral edges finely and densely punctate; vertex closely and densely punctate. Prothoracic spines absent; mesoscutum shiny and sparsely punctate with shallow punctures, punctures close on extreme antero-lateral margins; scutellum shiny and finely punctate on posterior margins; mesepisterna shiny but roughened due to obscure punctures over surface; propodeum with lateral and posterior faces dull and roughened basal area with many weak, longitudinal rugae; tegulae light hyaline brown; wings dusky with short, light ochreous pubescence especially on apical half, nervures yellow basally to light brown apically, stigma dark brown; legs black; posterior basitarsi short and slender, approximately four times as long as broad. Metasomal terga black, strongly tinged with blue giving surface metallic lustre; first metasomal tergum shallowly punctate giving surface roughened appearance at mid line, punctures more distinct laterally; second metasomal tergum finely folliculated with a broad, sharp basal depression; apical fasciae in

sharp depressions tending to deep testaceous in color; metasomal sterna with apical margins entire. Seventh ventral plate with long lateral fringes of pile as well as a clump arising on upper surface immediately beneath articulatory condyle, median discal area almost completely free of pile.

FEMALE: length 8.5 mm., wing length 6.5 mm.

Hair of face dense and white concentrated about antennal bases, extending up to ocellar triangle, pile most dense and partially appressed along inner orbital margins, few long hairs at edge of clypeus partially obscuring lateral faces of clypeus; vertex with a few scattered, pale grey to light ochreous hairs; upper genal areas with dense, short, white pile, becoming longer on lower and posterior faces, broad band of appressed, pure white pubescence extending from upper lateral faces of vertex to base of compound eyes immediately posterior to compound eyes; mesoscutum with abundant, short, plumose pubescence, slightly tinged with grey to light ochreous, concentrated principally over anterior half, lateral and posterior surfaces leaving impunctate area bare; scutellum with dense lateral and posterior fringe of light ochreous, plumose pile; metanotum with pile long, loose, and plumose; pronotum with lateral faces partially concealed by appressed, white pubescence, posterior lobes covered with dense, white pile; mesepisterna with dense covering of plumose pile, tending to conceal character of surface, pile light grey; propodeum with long,

white dorso-lateral fringe of hair extending down towards pedicel, lateral faces partially concealed by appressed, white pubescence, posterior face with a few erect, plumose hairs; legs with pile short and white, posterior femora with pile long, curved, and plumose, posterior tibiae with long, dense covering of pile; first metasomal tergum with scattered, white pile, most dense on upper anterior face, lateral fringes of dense, white pile most evident at extreme antero-lateral face, fringe becoming very weak at junction of posterior edge and apical fascia; second metasomal tergum with dense basal fascia of white pile of equal width to apical fascia; third metasomal tergum with a weak, almost indistinguishable basal fascia; fasciae of terga broad and white; discs of metasomal terga four and five with scattered, white to ochreous pile; sixth metasomal tergum with deep ferruginous, semi-appressed pile; sternal fasciae absent.

Antennae short, deep reddish brown, flagellum black basally; malar space about seven-eighths as long as wide; clypeus shiny, strongly convex, median sulcus distinct, becoming broadened medially, sulcus with abundant fine punctation along median broadened area, lateral rims of sulcus shiny and sparsely punctate with coarser punctures; vertex shiny with a few scattered punctures. Prothoracic spines long and blunt, at least as long as broad at base; mesoscutum distinctly punctate about antero-lateral and lateral edges, punctures no more than one puncture width

apart, becoming much finer and sparser towards mid line and posterior edge, impunctate area large and shiny; scutellum with posterior one-third finely and densely punctate; mesepisterna coarsely and densely punctate, punctures almost contiguous but leaving narrow, shiny interspaces; propodeum with lateral and posterior faces weakly folliculated or roughened, basal area longitudinally traversed by numerous weak rugae; tegulae light brownish hyaline; wings dusky with abundant, light ochreous pubescence especially on apical portions, nervures yellowish basally becoming dark brown at apex, stigma brown; legs black; posterior basitarsi four times as long as wide. Metasomal terga shiny black strongly tinged with blue giving a metallic lustre; metasomal terga one and two impunctate; metasomal terga three, four, and five shallowly folliculated; second metasomal tergum with a very shallow basal depression; sterna with posterior margins entire.

Distribution:

California: Victorville; Riverside; San Diego.

Arizona: Tombstone; Sedonia.

New Mexico: Albuquerque; Hot Springs; Carrizozo.

Utah: Leeds; Kanab.

Texas: El Paso

Dates:

June 10 to July 4

A single specimen labelled October 23 is available from

San Domingo, Baja California. From this specimen it would appear that this species has two generations, one in summer, the other a late fall flier which may emerge only in the southern parts of the range.

Plant Records:

Dalea scoparia; Eriogonum fasciculatum; Rhus laurina.

The holotype is located in the United States National Museum.

Colletes algarobiae Cockerell

algarobiae COCKERELL, 1900, Entom., vol. 33, p. 244;
COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 292;
SWENK, 1908, Univ. Nebraska Studies, vol. 1, p. 45;
COCKERELL, 1924, Proc. California Acad. Sci., ser. 4,
vol. 12, p. 532, 536; TIMBERLAKE, 1951, Wasmann J. Biol.,
vol. 9, p. 235

The species, originally described from Mesilla Park, New Mexico, is sparsely distributed over the extreme southwestern United States and northwestern Mexico.

The males have the malar space approximately one and one-quarter times as long as broad, the mesepisterna closely and deeply punctate above, and the seventh ventral plates slightly broadened apically and abruptly truncate with the inner apical margins strongly reflexed (See fig. 76).

The females are readily distinguished by the characters employed in the key.

MALE: length 8 mm., wing length 6 mm.

Hair of face short and dense, particularly along lower inner orbital margins, about antennal bases, and along upper edge of clypeus; vertex with a few white hairs in ocellar triangle; upper genal areas with few scattered pale grey hairs, becoming denser, longer, and whiter below and on posterior surfaces, a weak band of short appressed pubescence immediately posterior to compound eyes; mesoscutum with sparse covering of long, fine, pale grey hairs; scutellum with weak lateral and posterior fringes of pale grey pile, not concealing surface; metanotum with dense covering of long, weakly plumose hairs; mesepisterna with a few sparse, long, pale grey hairs; propodeum with dorso-lateral edges having long fringes of white pile extending half-way down to pedicel, lateral and posterior faces sparsely pilose; legs with short, sparse, white pile; first metasomal tergum with anterior face and disc sparingly pilose with short white pile, lateral fringes weak, evident only at extreme antero-lateral edge of disc, fascia narrow and weak; metasomal terga two to four with fasciae very broad but weakly covered with short white pubescence, fasciae broadest laterally; metasomal terga three to five with discs sparsely covered with short, fine, white pile; metasomal sterna with weak apical fasciae evident only at lateral edges. .

Antennae deep reddish-brown, becoming black basally, flagellar segments one and one-half times as long as broad; malar space one and one-quarter times as long as broad; clypeus strongly protuberant with a shallow broad longitudinal median sulcus, sulcus finely and densely punctate along entire length, lateral rims shiny, sparsely punctate with weak punctures, extreme lateral and dorsal edges of clypeus finely and densely punctate; vertex shiny, impunctate. Prothoracic spines short and sharp; mesoscutum shiny, weakly and sparsely punctate, almost folliculated, punctures most dense along antero-lateral margin; scutellum shiny impunctate, except in having posterior margin roughened; metanotum shiny impunctate; mesepisterna closely and densely punctate above, punctures becoming shallow and obscure on central discal areas, about one to two puncture widths apart; propodeum with lateral faces shiny, roughened over posterior surfaces, basal area weakly longitudinally striate; tegulae light brownish hyaline; wings dusky with abundant light ochreous pubescence most evident at apex; nervures and stigma light brown; legs reddish-brown, blackened basally, tending to light brown at apex; posterior basitarsi five times as long as broad. First metasomal tergum shiny, finely and sparsely punctate, almost folliculated; second metasomal tergum shiny and sparsely folliculated, with a sharp basal depression; metasomal terga one to four with apical fasciae in sharp depressions, depressed areas a light testaceous hyaline;

metasomal sterna with posterior margins entire; seventh ventral plates broadened slightly apically and abruptly truncate, inner apical margins strongly reflexed, dense fringes of pile along latero-apical and medio-apical margins (See Fig. 76).

FEMALE: length 9 mm., wing length 6.5 mm.

Hair of face pure white, pile erect about antennal bases and slightly appressed along inner orbital margins, a few long pale grey hairs extending from fronto-clypeal margin over surface of clypeus; ocellar triangle with clump of light ochreous pile; upper genal areas covered with short white pile, becoming much longer and sparser on lower and posterior surfaces, a broad rim of appressed white pubescence immediately posterior to compound eyes, broadest ventrally; mesoscutum covered with short, dense, light ochreous pile; scutellum with lateral and posterior edges densely rimmed with light ochreous pile; metanotum with sparse covering of tawny to light ochreous pile; posterior lobe of pronotum densely concealed by a clump of pure white pile; mesepisterna sparsely covered with long, erect, weakly plumose, tawny grey hairs; propodeum with dorso-lateral margins having a long fringe of white pile extending half-way down to pedicel, lateral and posterior faces with sparse covering of long, erect, pale grey pile; legs densely covered with short pale grey pile except posterior femora where it is long, curved, and weakly

plumose; first metasomal tergum sparsely covered with long, erect, pale grey pile, weak antero-lateral appressed areas, lateral fringes weak, not continuous to fascia; fascia pure white and narrowed medially; metasomal terga two to four with fasciae broad and pure white; discs of metasomal terga five and six with strong admixture of deep ferruginous to black erect pile; metasomal sterna non-fasciate.

Antennae short, light reddish-brown, becoming black basally; malar space short, approximately three-eighths as long as broad; clypeus weakly protuberant with median longitudinal sulcus not evident, surface coarsely punctate over median discal area, peripheral portions shiny impunctate; vertex shiny impunctate. Prothoracic spines short and sharp; mesoscutum shiny, weakly and shallowly punctate with fine punctures, punctures at least two puncture widths apart on anterior half, impunctate area large; scutellum shiny except for extreme posterior edge which is weakly roughened and finely punctate; metanotum shiny; mesepisterna with upper faces densely and coarsely punctate, punctures becoming much shallower and more obscure on discal area where they are at least two puncture widths apart; propodeum with lateral and posterior faces very weakly roughened and dull, basal area with a few scattered longitudinal striae, almost indistinguishable; tegulae light brownish hyaline; wings dusky with short, light ochreous

pubescence, most evident apically; nervures light brown; stigma dark brown; legs light reddish-brown; posterior basitarsi about four times as long as broad. First metasomal tergum black with blueish tinge, surface shiny except for a few scattered follicle-like punctures; metasomal terga two to four shiny and weakly folliculated; metasomal sterna with posterior margins entire.

Distribution:

6 miles west Indio, Riverside County, California, April 4, 1949 (Linsley, MacSwain, Smith) on Melilotus; Death Valley, Furnace Creek, California, April 14, 1938 (B. E. White) on Prosopis juliflora glandulosa; Imperial County, California, April, 1911 (Bridwell) on Prosopis; 20 miles west Mexicali, Baja California, April 4, 1939 (E. S. Ross) El Mayor, Baja California, April, 1939 (C. D. Michener) on Prosopis; Guaymas, Sonora, Mexico, April 7, 1921 (E. P. Van Duzee); Mesilla Park, New Mexico, May 20, (T. D. A. Cockerell).

The holotype is located in the United States National Museum.

Colletes clypeonitens Swenk

clypeonitens SWENK, 1906, Canadian Ent., vol. 38, p. 39
TIMBERLAKE, 1951, Wasmann J. Biol., vol. 1, p. 229.

The males of the species are easily distinguished from the rest of the daleae group in having the malar space twice as long as wide and in having the flagellum of the antennae a light yellow brown below. The yellowishness of the lower surfaces of the antennae may become less pronounced at the eastern extremities of the range where the color changes to light yellow red. The females have the metasomal terga almost completely covered with short, appressed pubescence and have a very long malar space. It may be confused with petalostemonis in this group, but differs in size, in having deep ochreous pile on the thoracic terga, and in having the punctures of the mesepisterna shallow to obscure.

MALE: length 8.5-9 mm., wing length 6 mm.

Hair of face long, loose and densely clumped about antennal bases and upper edge of clypeus, pile very short and somewhat appressed along lower inner orbital margins; pile of vertex and supra-antennal areas sparse and slightly tinged with grey; upper genal areas with pale grey pile, becoming longer and whiter below; mesoscutum with long, plumose, white to grey pile; scutellum with abundant, long, fine, plumose pile not obscuring surface, pile of scutellum continuous to metanotum; metapleura with abundant, long, fine, white pile over surface, sometimes tinged with grey above; propodeum with lateral and posterior faces with long, fine pile as on mesepisterna; legs with

shorter, white to pale grey pile, most densely concentrated on posterior femora and tibiae; first metasomal tergum with scattered, fine, white to pale grey pile not concealing surface, weak lateral fringes continuous to apical fascia, apical fascia narrow and loose; metasomal terga two to five with apical fasciae loose, white, and narrow; discs of metasomal terga two to five with abundant, erect, white to light golden pile; metasomal tergum six with scattered, semi-appressed, golden pile; metasomal sterna with broad apical fasciae, hair becoming broader medially, and sharply narrowed laterally.

Antennae long, flagellar segments about one and one-half times as long as wide, flagellum strongly tinged with deep yellow below; malar space twice as long as wide with weak longitudinal rugae basally; clypeus strongly protuberant with a median sulcus most evident basally, lateral rims of median sulcus shiny and sparsely punctate, punctures deep and dense along median sulcus; vertex closely, finely, and densely punctate. Prothoracic spines virtually absent; mesoscutum shiny with a few scattered, fine to obscure punctures, closest and most evident at anterior lateral edges; scutellum densely and finely punctate over posterior half, not rugose, anterior half impunctate; mesepisterna dull and obscurely punctate or with very fine, shallow punctures; propodeum with lateral and posterior faces dull and roughened, basal area with a few weak, longitudinal rugae; tegulae light ochreous hyaline; wings dusky with

scattered, light ochreous pile most evident apically, nervures light yellow brown basally, darker brown beyond stigma and first recurrent vein, stigma light brown; legs black; posterior basitarsi five times as long as wide; metasoma shiny black; first metasomal tergum with a few weak, scattered punctures giving surface a dull roughened appearance; second metasomal tergum dull and weakly folliculated, tergum with no abrupt basal depression; sterna with posterior edges entire.

FEMALE: length 9,5-10 mm., wing length 6.5 mm.

Hair of face long and fine about antennal bases, becoming much shorter and appressed along lower inner orbital margins, hair about antennal bases long, fine, and tinged with ochreous; pile of ocellar triangle long and bright ochreous; upper genal areas with pile light ochreous becoming lighter to pale grey below, pile immediately posterior to compound eyes short and appressed, tinged with ochreous, posterior and lower faces of genal areas with pile long, fine, and tinged with grey; mesoscutum with abundant, long, plumose, ochreous pile; scutellum with a strong covering of long, ochreous pile about lateral and posterior edges; metanotum with weak covering of light ochreous to grey pile; mesepisterna with abundant, long, fine, pale grey to whitish pile becoming more ochreous at extreme upper surface; metapleura; lateral and posterior faces of propodeum with abundant, long, pale grey pile;

legs with long, fine pile, longest on posterior femora which has long, fine, curved, ochreous hairs, especially plumose; metasomal terga covered with short, appressed, ochreous pile on first five terga; first metasomal tergum with shiny, non-pubescent area between fascia and basal appressed pubescence, occasionally present on second metasomal tergum; basal appressed pubescence of first metasomal tergum with strong admixture of long, erect pile; appressed pile sparse leaving apical fasciae easily discernible; metasomal tergum six with semi-appressed, golden pile; metasomal sterna with weak apical fringes of white pile on sterna two to five.

Antennae light reddish brown, becoming dark brown to black basally; malar space one and one-quarter times as long as wide; clypeus abruptly protuberant with a shallow median sulcus, sulcus with a few deep, coarse punctures, lateral rims sparsely punctate with a few deep punctures; vertex dull, finely and densely punctate. Prothoracic spines absent; mesoscutum with abundant, fine, shallow punctures, punctures at least one puncture width apart; scutellum with abundant fine punctures over posterior two-thirds; mesepisterna dull, shallowly to obscurely punctate, punctures about two to three puncture widths apart; propodeum with lateral and posterior faces dull and slightly roughened; tegulae light ochreous hyaline; wings with nervures light yellowish brown basally, stigma and apical veins deep brown, wings with apex having sparse

covering of ochreous pubescence; legs black; posterior basitarsi long and broad, about four times as long as wide; metasomal terga shiny beneath appressed pubescence, with a few weak, follicle-like punctures scattered over disc; metasomal terga two to four weakly folliculated; metasomal sterna entire.

Plant Records:

Larrea divorticula, L. glutinosa, L. tridentata, Parosela polyadenia, Prosopis juliflora.

Distribution:

California: Westmoreland, Imperial County; Riverside County; San Diego County; Inyo County; San Bernardino County; Trona; Stove Pipe Wells

Nevada: Lake Meade; Glendale.

Arizona: 5 miles east Yuma; Gila Bend; Welton.

Texas: Hot Springs, Big Bend Park.

Flight Records:

March 6 to June 15.

Plant Records:

As above.

The types are located in the collection of the University of Nebraska.

Colletes covilleae Timberlake

covilleae TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9,
p. 231.

The males of this species are practically indistinguishable from salicicola except on the basis of the seventh ventral plates. Occasionally the second metasomal tergum of covilleae has a much smoother disc than does salicicola, however, this is by no means a salient character. The females are readily distinguished from salicicola in having the metasomal terga covered with appressed pubescence and, except for a much shorter malar space, resemble petalostemonis and clypeonitens.

MALE: length 7.5 mm., wing length 6 mm.

Hair of face long and pure white, somewhat appressed along lower inner orbital margins, hair long, fine, and loose, not completely concealing clypeus; ocellar triangle with a few short pale grey hairs; upper genal areas with sparse, short, white pile, becoming much longer and whiter below, a narrow margin of shorter appressed pubescence immediately posterior to compound eyes; mesoscutum with abundant, long, fine, pale grey pile, not obscuring surface; scutellum with very weak lateral and posterior fringe of pile; metanotum with few fine plumose hairs; pronotum with posterior lobe sparingly covered with short white pile; mesepisterna with abundant, plumose, pale grey to

white pile; propodeum with dorso-lateral edge having weak fringe of long pale grey pile, lateral and posterior faces with sparse, fine, pale grey pile; legs with abundant, long, weakly plumose, white pile; first metasomal tergum with anterior face of disc having moderately dense covering of long white pile, lateral fringes very weak, apical fascia weak and narrow; metasomal terga three to five with fasciae broad, ragged, and lightly tinged with pale grey; metasomal terga two to five with discs having abundant, fine, short, light ochreous to tawny grey pile giving surface whitish to golden sheen, pile becoming much longer apically; metasomal sterna with broad white apical fasciae, broadest at middle, becoming progressively narrower laterally.

Antennae reddish-brown, flagellar segments about one and three-quarters times as long as broad; malar space one and one-half times as long as broad; clypeus strongly protuberant with deep median longitudinal sulcus continuous to apex, median sulcus finely and densely punctate, lateral rims shiny and sparingly punctate with deep coarse punctures, lateral and dorsal clypeal margins finely and densely punctate and roughened; vertex shiny with a few scattered weak punctures. Prothoracic spines distinct and sharp; mesoscutum densely punctate over anterior half and lateral margins, punctures one puncture width apart, impunctate area large; scutellum with posterior one-third roughened, densely punctate; metanotum shiny and roughened; mesepisterna with shallow obscure punctures leaving surface

roughened and dull; propodeum with lateral and posterior faces roughened, basal area with few scattered longitudinal rugae; tegulae light brownish hyaline; wings whitish hyaline with very sparse, light ochreous pubescence at apex, nervures and stigma light brown; legs black basally, tending to brown at apex; posterior basitarsi long and slender, approximately four and one-half times as long as broad. First metasomal tergum shiny and sparsely folliculated; second metasomal tergum shiny with a few, scattered, weak, follicle-like depressions, tergum with sharp basal depression; metasomal sterna with apical margins entire; seventh ventral plate slightly expanded apically with truncate apex, about one and one-quarter times as long as broad (See Fig. 78).

FEMALE: length 9.5 mm., wing length 6.5 mm.

Hair of face sparse, short, tinged with light ochreous, erect about antennal bases and partially appressed along inner orbital margin, a few long pale grey hairs extending from base of clypeus over extreme lateral portions; ocellar triangle with strong clump of deep ochreous pile; upper genal areas with ochreous short pile, becoming longer and whiter on lower and posterior margins, a broad band of light ochreous to pale grey appressed pile immediately posterior to upper two-thirds of compound eyes; mesoscutum with pile short, weakly plumose, and deep ochreous, concentrated principally about anterior half and lateral margins; scutellum with lateral and posterior fringes of long

ochreous pile; metanotum densely covered with light ochreous hairs; mesepisterna with dense covering of long pale grey pile; propodeum with dorso-lateral margins with long fringes of light ochreous pile, extending one-third of way to pedicel, lateral faces partially concealed by light ochreous appressed pubescence, posterior face with a few long pale grey hairs; legs with long white to ochreous pile, pile very dense on posterior femora and tibiae; first metasomal tergum with surface partially obscured by light ochreous pubescence, especially at lateral faces of disc, appressed pubescence replaced by long erect pile over median discal surface; metasomal terga two to five with surface having weak covering of short, appressed, ochreous pubescence, not completely concealing surface; fasciae broad and weakly pubescent; sixth metasomal tergum with dense covering of semi-appressed golden pile; metasomal sterna lacking fasciae.

Antennae short, deep reddish-brown, flagellum becoming much darker basally; malar space about five-eighths as long as wide; clypeus strongly protuberant with deep longitudinal median sulcus extending to apex, lateral impunctate rims with a few coarse scattered punctures; vertex shiny with scattered fine punctures. Prothoracic spines vestigial; mesoscutum closely and densely punctate over anterior half and on lateral faces, punctures less than one puncture width apart, impunctate area large and shiny; scutellum with posterior one-third densely and finely punctate;

metanotum shiny; mesepisterna deeply and densely punctate with punctures about one-half puncture width apart, interspaces shiny; propodeum with lateral and posterior faces shiny and weakly roughened, basal area with few longitudinal striae; tegulae brown hyaline; wings dusky covered with short, light ochreous pubescence most evident apically, nervures and stigma dark brown; legs black, becoming dark brown apically; posterior basitarsi three and one-half times as long as wide. Metasomal terga shiny and weakly folliculated beneath appressed pubescence.

Assuming the sex association to be correct, I am surprised to find this the only species in which the prothoracic spines are sharp and distinct in the male yet absent in the female. It is customary for this condition to be reversed. Otherwise the sexes show close morphological resemblance.

Distribution:

1 male, about 8 miles south of Victorville, Mohave Desert, California, May 22, 1932 (P. H. Timberlake) on Larrea glutinosa; 1 male, 20 miles south of Palacio, Baja California, April 1939 (C. D. Michener); and 1 female, Andreas Canyon, near Palm Springs, California, April 11, 1936 (P. H. Timberlake) on Larrea divericate (all paratypes).

The holotype is in the collections of the Citrus Experiment Station, Riverside, California.

Colletes salicicola Cockerell

salicicola COCKERELL, 1897, Ann. Mag. Nat. Hist., ser. 6, vol. 19, p. 50; COCKERELL, 1897, Bull. New Mexico Agr. Expt. Sta., no. 24, p. 24; COCKERELL, 1898, Bull. Denison Univ., vol. 11, p. 43; COCKERELL, 1898, Bull. Univ. New Mexico, vol. 1, p. 43; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 292; COCKERELL, 1930, Amer. Mus. Nov., no. 397, p. 5; Bohart et al., 1950, Utah Agr. Expt. Sta. Mimeo. Circ. no. 371; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 230.

The species, described from a female taken at Las Cruces, New Mexico, is one of the more common vernal members of the group. Both sexes are most likely to be confused with daleae, and in the females the two are distinguished only with difficulty. The males can be separated at once by the form and distinctive hair patterns of the seventh ventral plates. The females are extremely difficult to tell from daleae but differ in having the prothoracic spine either vestigial or completely absent. The more easterly populations of salicicola occasionally have short vestigial spines but in the western individuals the angle is uniformly rounded. As in the male, the second metasomal tergum is distinctly punctate with somewhat angulate punctures rather than the normally round punctures of the thorax and mesepisterna.

MALE: length 8 mm., wing length 6 mm.

Hair of face long and white, completely concealing basal portion of clypeus, weak sparse pubescence along lower half of inner orbital margins; vertex with few scattered pale grey hairs concentrated principally in the ocellar triangle; upper genal areas with pure white pile, becoming long and much denser over posterior and lower faces; mesoscutum with light ochreous to pale grey pile, partially concealing surface; scutellum with weak lateral and posterior fringes of long, erect, pale grey pile; metanotum with few scattered, pale grey hairs; mesepisterna with weak covering of very long, fine, ragged, pale grey pile; propodeum with heavy dorso-lateral fringes of pile extending half-way down to pedicel, lateral and posterior faces with sparse covering of fine pale grey pile; legs with abundant long white pile; first metasomal tergum with anterior face and disc sparsely covered with ragged pale grey pile, lateral fringes of white pile longest and most dense at extreme anterior lateral edges, becoming shorter and weaker as fringe nears fascia, apical fascia weak, pale grey, and ragged; metasomal terga two to five with fasciae broad and pure white; metasomal terga two to five with discs having short, fine, erect, white pile, giving surface whitish sheen when viewed laterally; metasomal tergum six with semi-appressed, light golden pile; metasomal sterna with broad, dense, white apical fasciae, broadest at mid line.

Antennae long and deep brown, flagellar segments one and three-quarters times as long as broad; malar space one and one-half times as long as broad, weakly striate basally; clypeus strongly convex with a deep median longitudinal sulcus, sulcus finely and densely punctate along entire length, lateral rims shiny and sparsely punctate with coarse punctures; vertex shiny with a few scattered fine punctures. Prothoracic spines absent; mesoscutum with shallow scattered punctures most dense on anterior and extreme lateral faces where they are no more than one puncture width apart, punctures becoming sparse and much shallower towards posterior and median surfaces of mesoscutum; scutellum shiny and very finely punctate on extreme posterior margin; mesepisterna dull and roughened due to shallow obscure punctures; propodeum with lateral and posterior faces roughened and dull, basal area with abundant close longitudinal weak striae; tegulae light brownish hyaline; wings whitish hyaline to dusky with fine, short, ochreous pubescence on extreme apical portion, nervures light brown, stigma dark brown; legs black; posterior basitarsi weakly rounded above, about five times as long as broad. Metasomal terga shiny black; first metasomal tergum distinctly punctate or coarsely folliculated, surface rough but with black lustre; second metasomal tergum closely and densely punctate or coarsely folliculated, follicles very close and almost contiguous

over anterior portion of disc, follicles angulate rather than round; second metasomal tergum with abrupt basal depression; metasomal terga three and four shiny and roughened; metasomal sterna with apical margins entire; seventh ventral plates at least twice as long as broad at base, apex expanded and broadly rounded with dense lateral fringe to each plate, pubescent portion of plates restricted to apical half (See Fig. 79).

FEMALE: length 9 mm., wing length 6 mm.

Hair of face white and slightly tinged with light ochreous above; pile dense along inner orbital margins where it is slightly appressed, pile erect about antennal bases and extending down from dorso-lateral edges of clypeus partially concealing lateral edges of clypeus; vertex with pile light ochreous; upper genal areas with short white pile, becoming longer on lower and posterior surfaces, broad band of appressed white pubescence immediately posterior to compound eyes; mesoscutum with short, dense, ochreous pile particularly over anterior half and lateral edges, impunctate area free of pile; scutellum with weak lateral and posterior fringe of long, light ochreous pile; metanotum with dense covering of plumose, light ochreous hairs; mesepisterna with sparse covering of long plumose hairs, not at all concealing surface; propodeum with strong dorso-lateral fringes of long white pile extending down to pedicel, lateral faces concealed partially by short, white,

appressed pubescence, posterior face with abundant, long, erect, pale grey pile; anterior two pairs of legs with abundant long white pile basally, tarsi with strong ochreous pile; posterior femora and tibiae with long, light ochreous pile; first metasomal tergum with anterior face and disc partially concealed laterally by semi-appressed white pile, appressed pubescence with strong admixture of long, erect, fine, pale grey hairs, lateral fringes weak, most evident on anterior lateral margins, becoming weak at apical fascia, apical fasciae tinged with light ochreous and broad; metasomal terga two and three with weak basal fasciae; metasomal terga two to five with discs having short, fine, erect, white pile, giving surface a whitish sheen; sixth metasomal tergum with dense covering of semi-appressed golden hairs; sternal fasciae absent.

Antennae with flagellum reddish-brown below and black above; malar space about seven-eighths as long as broad; clypeus strongly protuberant, with a distinct, narrow, deep median sulcus extending to apex, sulcus covered with fine dense punctures, lateral rims shiny black with few coarse scattered punctures, extreme lateral edges finely and densely punctate; vertex shiny with a few fine punctures. Prothoracic spines virtually absent or vestigial; mesoscutum coarsely punctate over anterior half and lateral edges, punctures no more than one puncture width apart with shiny interspaces, impunctate area large and shiny; scutellum shiny, densely punctate on extreme posterior one-third of surface; mesepisterna coarsely and densely punctate on

extreme upper surface, puncturation becoming much sparser and shallower on lower surfaces of disc, interspaces broad and shiny, punctures about two puncture widths apart; propodeum with lateral and posterior faces weakly roughened but shiny, basal area with many longitudinal weak striae; tegulae light hyaline brown; wings whitish hyaline, with abundant light ochreous pubescence particularly at apex, nervures brown, stigma dark brown to black; legs deep black basally, strongly tinged with brown at apex; posterior basitarsi approximately four times as long as broad. First metasomal tergum shiny black with a few scattered follicles; second metasomal tergum coarsely folliculated, follicles angulate, not rounded, approximately one to two puncture widths apart on anterior face of disc; metasomal terga three to five weakly and shallowly folliculated.

Distribution:

Texas: Big Bend National Park.

New Mexico: Mesilla; Kerr Ranch.

Arizona: Dublin; Sahuarita; Tucson; Yuma; Gila Bend;

Palmerlee; Welton; Ajo; Maricopa Mountains; Douglas

Nevada: Lake Meade.

California: Palm Springs; Riverside County; Inyo County;

Desert Centre; Imperial County; San Bernardino

County; Trona; Kern County.

Flight Records:

The species has been recorded as flying between February 17 and June 15 with the main flights occurring during April.

Plant Records:

Cercidium, Dalea; Eriogonum; Hyptis; Larrea tridentata var. glutinosa; Phacelia popei; Prosopis juliflora var glandulosa.

The holotype is located in the collection of T.D.A. Cockerell.

Colletes deserticola Timberlake

deserticola TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 232

The males of the species may be confused with prosopidis or algarobiae of the daleae group; however, they differ from the former in having a dark brown to black lower surface of the flagellum and in having the antennal segments at least one and one half times as long as wide; in deserticola the punctures of the mesepisterna are more distinct. It is more difficult to separate algarobiae from deserticola; however, deserticola has the malar space approximately as long as wide and has the clypeus short and closely punctate across the base; the lower mesepisterna of the male are shallowly and obscurely punctate rather

than showing the closer, deeper punctures of algarobiae. The seventh ventral plate of deserticola is slightly broadened apically and broadly rounded on the extreme apical margin. The females are most easily confused with daleae but differ from daleae in having the malar space shorter, slightly more than one half as long as wide; in having the basal fasciae of metasomal terga two and three broad and dense, and in having the clypeus scarcely sulcate medially.

MALE: length 9-9.5 mm., wing length 6 mm.

Hair of face pure white, long and dense, concentrated principally about antennal bases and completely concealing clypeus, pile virtually absent above antennal bases; ocellar triangle with a few long, pale grey hairs; upper genal areas with short white pile, becoming much longer on lower and posterior surfaces, area immediately posterior to compound eyes covered with short, appressed pubescence; mesoscutum with long, plumose, pale grey pile, not concealing surface; scutellum with a sparse covering of pale grey pile about lateral and posterior margins, extending over posterior one half of surface; metanotum weakly covered with long, sparse, pale grey pile; mesepisterna and metapleura with sparse covering of long, whitish to pale grey pile; propodeum with dense dorso-lateral fringe of long white pile extending from basal area, half way to pedicel; legs

with short, white pile, tending to be loose and ragged; first metasomal tergum with sparse covering of long, white pile and very weak lateral fringes not complete to apical fascia; metasomal fasciae narrow, composed of loose, ragged white pile; metasomal terga four and five with discs having sparse erect pale grey to golden pile; metasomal tergum six with weak covering of semi-appressed golden pile; sternal fasciae broad and pure white, slightly broader at mid line.

Antennae strongly tinged with light reddish brown beneath, flagellar segments no more than one and one half times as long as wide; malar space about as long as wide; clypeus strongly convex with a shallow median sulcus most evident on basal half, basal area of clypeus and a broad longitudinal median band closely and densely punctate leaving very narrow impunctate ridges, ridges occasionally with a few scattered punctures; vertex shiny with a few scattered fine punctures. Prothoracic spines absent; mesoscutum shiny, obscurely punctate to impunctate with a few follicle-like punctures scattered over surface; scutellum smooth and shiny with a few scattered punctures about lateral and posterior edges; mesepisterna smooth, shiny and virtually impunctate except for a few fine scattered punctures approximately two to four puncture widths apart on disc, punctures distinct and rather deep on extreme upper edge of mesepisterna immediately beneath scrobal area; propodeum with lateral and posterior faces dull, basal area

with a few weak longitudinal rugae; tegulae brown; wings tending to whitish hyaline and non-pubescent, nervures light brown, stigma dark brown; legs black basally, tarsi plus apices and bases of tibiae light brown; posterior basitarsi long and slender approximately four and one half times as long as wide. Metasoma with basal terga black, strongly tinged with blue giving a metallic lustre to discs; first metasomal tergum shiny and weakly folliculated over surface; second and third metasomal terga with follicules shallower and somewhat closer; second metasomal tergum with basal depression abrupt; metasomal sterna with apical margins entire; seventh ventral plates short and broadened apically, apical lateral and median margins broadly rounded, inner margins of plate slightly reflexed, dense hair bands along inner median margins and a broad longitudinal hair band along lateral margin from below articulation to extreme apex, apex broadly rounded.

FEMALE: length 9.5-10.5 mm., wing length 6.5 mm.

Hair of face short, white and concentrated principally along inner orbital margins where it tends to be somewhat appressed, dense scattering of plumose pile immediately above antennal bases and extending nearly to vertex; fronto-clypeal margin with a few long, fine hairs extending over surface of clypeus and partially concealing surface; vertex with clump of shorter ochreous pile; upper genal areas with short, light ochreous pile, becoming sparser, longer,

and whiter on lower and posterior portions; genal areas with broad, dense, appressed pubescence immediately posterior to compound eyes; mesoscutum with short, dense, plumose, ochreous pile; scutellum with lateral and posterior edges having dense fringe of longer, plumose, ochreous pile not extending forward over anterior half; mesepisterna with sparse, scattered, pale grey pile; propodeum with lateral faces concealed by short, appressed, whitish pile, dorso-lateral edges with long, pale grey fringe, posterior face with scattered, erect, pale grey pile; legs with short, tawny pile except for posterior femora and tarsi, posterior femora with sparse covering of long, curved, plumose hairs; tibiae with pile much shorter, denser, and ochreous particularly on lateral and lower surfaces; first metasomal tergum with scattered pile over disc, becoming somewhat appressed on anterior lateral portion of disc, appressed pubescence absent medially, weak lateral fringes, not complete to apical fascia; metasomal terga two and three with very broad basal fasciae, basal fasciae as broad as non-pubescent area between basal and apical fascia of each segment; apical fasciae on metasomal terga two to five broad and pure white; apical fascia of metasomal tergum one strongly narrowed medially; metasomal terga four to six with deep ferruginous to black, semi-erect pile over surface; metasomal sternal fascia absent.

Antennae reddish brown, black basally; malar space slightly more than one half as long as wide; clypeus shiny

with a deep median sulcus having a few deep, coarse punctures along its length, punctures much more sparse on lateral rims; vertex shiny with a few weak, scattered punctures. Prothoracic spines short and sharp; mesoscutum densely and deeply punctate over anterior one half and lateral and posterior edges, impunctate area small; scutellum with lateral and posterior margins deeply punctate; mesepisterna deeply and coarsely punctate over entire surface, punctures approximately one puncture width apart, interspaces shiny; basal area of propodeum with a few random rugae; tegulae brownish hyaline; wings with a few scattered, ochreous hairs, nervures and stigma dark brown; legs black, posterior basitarsi three and one half to four times as long as broad. First metasomal tergum shiny with few scattered follicles; discs of metasomal terga two and three very shallowly folliculated; metasomal sterna entire.

Distribution:

California: Furnace Creek, Death Valley; Oasis, Riverside County; Indio, Riverside County; Bard, Imperial County; Kane Springs.

New Mexico: Mesilla Park.

Flight Records:

March 29 to May 20.

Plant Records:

Prosopis juliflora var. glandulosa; Melilotus indica.

Females taken at Riverside County differ markedly from the types in the following respects: the punctation of mesoscutum is sparse on the posterior half and there is an extremely large impunctate area, the punctures on the anterior half of the mesoscutum are much smaller and not nearly so close being at least one puncture width apart; the basal hair bands of the second and third metasomal terga are very much narrowed and may be completely hidden on the third in some cases; the median sulcus of the clypeus is ~~not~~ nearly so deep as is the typical specimen. The female from El Mayor, Lower California, is indistinguishable from the Riverside County specimens.

An additional male has been taken at Mesilla Park in New Mexico which I believe belongs to this species. This specimen probably deserves subspecific rank as the punctures of the mesepisterna are shallow, sparse, and obscure; the apical fascial depressions of the metasoma are extremely broad and very light hyaline; the abdomen retains the bluish metallic lustre as common to the Californian specimens; the antennae are tinged with yellow beneath, even more so than in the allotype; the clypeus is more coarsely punctate and the median sulcus is deeper basally than in the typical specimens from Death Valley.

I believe the Riverside and the New Mexican specimens represent the ends of the known range of the species and that they should probably rank as subspecies. The type locality is somewhat intermediate between the two known

peripheral localities.

The holotype is located in the collection of the Citrus Experiment Station, Riverside, California.

Colletes petalostemonis Swenk

petalostemonis SWENK, 1906, Canadian Ent., vol. 38, p. 40; TIMBERLAKE, 1943, Bull. Amer. Mus. Nat. Hist., vol. 81, p. 400; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 236.

This is the most eastern member of the daleae group and is distributed generally along the extreme western edge of the great plains, extending as far north as Alberta and south into New Mexico then westward to Arizona. The males of the species are distinguished by having the malar space at least one and one half times as long as wide; in having the mesepisterna deeply and coarsely punctate with sharply delineated punctures no more than one puncture width apart with shiny interspaces; in most specimens the discs of the first and second metasomal terga are coarsely and closely punctate. The females are readily distinguished in having the metasomal terga almost completely covered with short, appressed, white pubescence. Usually there is a very narrow bare pre-fascial discal area on metasomal terga one and two; where this non-pubescent area is not present the prefascial area is sparsely

covered with pubescence. The malar space is at least as long as wide, and the punctures of the mesepisterna are deep and close, separated by shiny interspaces. The pile of the vertex and mesoscutum is pure white to pale grey.

MALE: length 7.5 mm., wing length 6 mm.

Hair of face long, pure white and dense about antennal bases and over clypeus, some appressed pubescence along lower inner orbital margin; vertex with pile white; genal areas with short, white pile over upper surfaces becoming longer on lower and posterior faces; mesoscutum with scattered white to pale grey pile; scutellum with longer, plumose pile about lateral edges and over posterior one half; mesepisterna with long white pile, not obscuring surface; legs with long pure white to pale grey pile; first metasomal tergum having anterior face and disc with long scattered, erect, white pile, lateral fringes moderately dense, long, white pile, extending posteriorly to apical fascia, first apical fascia narrow and ragged; apical fasciae of metasomal terga two to five broader and pure white; second metasomal tergum with a weak basal fascia in an abrupt basal depression; discs of metasomal terga two to six with long, scattered, erect, pure white pile, giving surface a whitish tinge; metasomal sterna with apical fasciae broad and pure white medially, becoming abruptly narrowed at lateral edges; sixth metasomal sterna with a light clump of pile at extreme apical face.

Antennae light brown to reddish brown, flagellar segments slightly longer than wide; malar space approximately one and five eighths as long as wide; clypeus strongly protuberant, having a deep median sulcus most evident basally, sulcus closely and finely punctate, lateral rims of sulcus shiny and sparsely punctate with coarse punctures; vertex shiny, roughened with a few scattered punctures. Prothoracic spines very short and sharp; mesoscutum shiny with scattered shallow or obscure punctures over entire surface; scutellum shiny with close, dense punctures about posterior edge, scutellum with a deep median longitudinal emargination; mesepisterna deeply and coarsely punctate, interspaces shiny, punctures no more than one puncture width apart; propodeum with lateral faces shiny and roughened, posterior lateral margins roughened and broadly rounded, basal area with indistinct quadrate pits and a few weak longitudinal rugae; tegulae light hyaline brown; wings whitish hyaline with short sparse scattered pubescence, nervures light yellow basally, stigma and apical veins deep brown to yellow-brown; legs light reddish brown becoming darker basally. First metasomal tergum shiny, deeply punctate with coarse punctures, punctures approximately one to two puncture widths apart at mid line, becoming closer at lateral face; metasomal terga two and three shiny with abundant coarse punctures, no more than one puncture width apart; second metasomal tergum with an

abrupt basal depression, depression weakly roughened with obscure punctures; metasomal sterna shiny with apical margins entire.

FEMALE: length 8.5 mm., wing length 6 mm.

Hair of face pure white, concentrated principally about antennal bases, hair somewhat appressed along inner orbital margins; ocellar triangle with pile white to slightly tinged with grey; upper genal areas with abundant light grey to white pile becoming longer on extreme posterior and ventral margins of occiput, abundant appressed pure white pile extending from dorsal to ventral surface behind compound eyes; mesoscutum densely covered with short, plumose, tawny pile almost concealing surface; scutellum with long plumose pile about lateral and posterior margins, with posterior one third of surface covered; metanotum densely covered with shorter grey plumose pile; pronotum with lateral surfaces completely concealed with short, pure white, appressed pubescence; mesepisterna with scattered, long fine pile, not concealing surface; metapleura with short semi-appressed pile not obscuring surface; propodeum with lateral faces covered with short white appressed pile, posterior faces with abundant long, fine pile; anterior two pairs of legs with short light ochreous to pale grey pile; posterior femora with a long fringe of curved plumose hairs, posterior tibiae with abundant short, non-plumose white to pale grey pile; metasoma nearly completely covered

with short, pure white appressed pubescence; first and second metasomal terga with a narrow non-pubescent pre-fascial band of variable width; metasomal terga three to five completely covered with appressed pubescence; apical fasciae discernible as a much denser mass of short ragged pubescence; sternal fasciae absent.

Antennae deep reddish brown becoming dark brown basally; malar space approximately seven eighths as long as wide; clypeus abruptly protuberant and shiny with a shallow to obscure longitudinal median sulcus, sulcus evident as linear emargination on basal half, a few scattered coarse punctures over surface; vertex shiny particularly about ocellar triangle, densely punctate above compound eyes. Prothoracic spines virtually absent; mesoscutum closely, coarsely punctate over anterior half and about lateral and posterior edges, impunctate area large and shiny; scutellum with posterior one third closely punctate, a few scattered punctures extending over anterior two thirds of scutellum; mesepisterna coarsely and densely punctate, punctures approximately one half puncture width apart, interspaces shiny; propodeum with lateral and posterior surfaces roughened, shiny, basal area with a few longitudinal rugae giving semblance to a few shallow, linear pits; tegulae light testaceous hyaline; wings whitish hyaline with scattered light ochreous pubescence, particularly on apical portion, nervures light

yellow basally, stigma and apical veins light yellow brown; legs reddish brown, posterior basitarsi about four times as long as wide. First metasomal tergum shiny and coarsely punctate, punctures beneath appressed pubescence approximately one to two puncture widths apart at mid line becoming slightly more dense toward lateral faces; second and third metasomal terga finely punctate almost folliculated; second metasomal tergum with weak basal depression; apical fasciae in broad testaceous rims; sterna with apical margins entire.

Distribution:

Alberta: Medicine Hat; Manyberries.

North Dakota: Beade.

South Dakota: Hot Springs.

Nebraska: Munroe Canyon, Glen Sioux County.

Wyoming: Lusk; Sheridan; Wheatland.

Colorado: Boulder; Larimer County.

Utah: Rainbow Bridge.

New Mexico: Jemez Springs; Albuquerque; Isleta.

Arizona: Holbrook.

Flight Records:

June 25 to August 27.

Plant Records:

Melilotus alba, Petalostemon flavescens.

The types are located in the collections of the University of Nebraska.

Colletes prosopidis Cockerell

prosopidis COCKERELL, 1897, Ann. Mag. Nat. Hist., ser. 6, vol. 19, p. 46; COCKERELL, 1898, Bull. Denison Univ., vol. 11, p. 42; COCKERELL, 1898, Bull. Univ. New Mexico, vol. 1, p. 42; COCKERELL, 1899, Catalogo de las Abejas de Mexico, Secretaria de Fomento, p. 4; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 292; TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 235.

The species is the smallest of the daleae group and is readily distinguishable by the color of the flagellum which is very light yellow beneath. The male has a short malar space, approximately as long as wide; the punctation over the entire body is extremely shallow and almost obscure. The female has the flagellum and punctures as in the male

MALE: length 6.5 mm., wing length 4.5 mm.

Hair of face pure white and long, concealing most of clypeus, pile along inner orbital margin somewhat appressed; vertex with little white to pale grey pile; upper genal area with a few short, white hairs, becoming much longer below, a weak margin of appressed pubescence posterior to compound eyes; mesoscutum with sparse covering of fine, white to pale grey pile; scutellum with dense lateral and

posterior fringe of long, white pile, somewhat plumose; metanotum with a few scattered, white hairs; posterior lobes of pronotum with dense clump of long, white pile; mesepisterna and metapleura with scattered long fine pile not at all concealing surface; propodeum with weak latero-dorsal fringe of pale grey pile, lateral and posterior faces with scattered pile; legs with very little pile, having a few white to grey hairs on femora and tibiae; first metasomal tergum with anterior face and disc with a few white hairs, rather dense lateral fringes extending to apical fascia, apical fascia narrow and pure white; discs of metasomal terga two to five with fine, short, white, erect pile, giving surface whitish sheen when viewed laterally; metasomal sterna with weak apical fasciae most evident laterally, pile absent on mid line except of metasomal sternum two where it is broad.

Antennae light yellowish red, much more yellow beneath, flagellar segments about one and one third times as long as wide; malar space about as long as broad; clypeus not strongly protuberant, median sulcus very shallow and almost indistinguishable except at base, basal half closely and densely punctate, punctures extending down median weakly sulcate portion to apex, very small lateral impunctate areas; vertex shiny with a few shallow punctures.

Prothoracic spines short and sharp; mesoscutum virtually impunctate, shiny except for a few follicle-like punctures especially at extreme lateral and anterior faces; scutellum

shiny impunctate except on extreme lateral and posterior edges; mesepisterna shiny and virtually impunctate; propodeum with lateral and posterior faces roughened and dull, basal area with few to no weak rugae; tegulae deep brownish hyaline; wings whitish hyaline with nervures and stigma light brown, becoming much more yellow basally; legs deep reddish brown, tarsi lighter brown, posterior basitarsi long and slender, approximately four times as long as broad. First metasomal tergum shiny black with a distinct bluish lustre, a few weak punctures over disc; second metasomal tergum obscurely punctate with close shallow, obscure follicles, tergum with abrupt basal depression; metasomal terga three to five shiny and weakly roughened; sterna entire. Seventh ventral plate quadrate with extreme apical margin sloping basally towards median edge; dense fringes of pile along lateral and basal median edge of plates.

FEMALE: length 7.5 mm., wing length 5.5 mm.

Hair of face white, short and erect about antennal bases, becoming more dense and partially appressed along lower three quarters of inner orbital margins; vertex with little pale grey pile in ocellar triangle; upper genal areas with pile short and white, becoming sparser on posterior and lower portions, a broad band of appressed white pubescence immediately posterior to compound eyes; mesoscutum with very few scattered tawny hairs; scutellum with a rim of pale grey pile about lateral and posterior

edges, not at all obscuring surface; metanotum with a few scattered pale grey hairs; mesepisterna with a few sparse, fine hairs; posterior lobes of pronotum with a dense white covering of short, plumose, erect pile; propodeum with strong dorso-lateral fringe of white pile extending half way down to pedicel, lateral and posterior faces covered with rather short, semi appressed hairs; anterior two pairs of legs with sparse covering of pile, apices of tibiae with dense clump of white to pale grey pile on upper surface, posterior femora with a few long, curved, plumose hairs, posterior tibiae having lateral and ventral surfaces closely pilose; first metasomal tergum having anterior face of disc with a few scattered fine hairs, disc virtually free of any pilosity, very weak lateral fringe on extreme anterio-lateral margin; fasciae pure white and narrow; disc of metasomal tergum five with a deep golden semi-erect pile; metasomal tergum six with deep ferruginous to deep golden semi-appressed pile; sternal fasciae absent.

Antennae short, strongly tinged with yellow beneath, base deep brown to black; malar space three eighths as long as wide; clypeus strongly convex, median sulcus almost completely indistinguishable, shiny with a few coarse punctures especially along median line, surface shiny with a few scattered punctures over lateral ridges; vertex shiny especially about ocellar triangle, a few fine punctures above compound eyes. Prothoracic spines short and sharp;

mesoscutum shiny, obscurely punctate to impunctate except for a few follicle-like punctures about anterior and lateral edges, very large shiny impunctate area; scutellum shiny, black and a few fine dense punctures about posterior edge; mesepisterna shiny, shallowly to obscurely punctate, punctures scattered at least two to four puncture widths apart; propodeum with anterior portion of lateral faces shiny, becoming roughened over posterior portion of lateral face and posterior face of propodeum, basal area smooth, non rugose; tegulae deep brown hyaline; wings dusky to whitish with short ochreous pubescence at apex, nervures and stigma deep brown; legs deep brown to black, posterior basitarsi three and one half times as long as wide. Metasoma with discs black, tinged with deep blue, giving metallic lustre to surface of terga one and two; metasomal terga one to three shiny and somewhat folliculated, follicles sparse and shallow at least two puncture widths apart at mid line; discs of metasomal terga two to five shiny and weakly roughened; metasomal sterna entire.

Distribution:

California: Imperial County; Indio, Riverside County;
Furnace Creek, Death Valley, Kane Springs.

New Mexico: Mesilla Park; Las Cruces.

Texas: Hot Springs, Big Bend Park.

Flight Records:

March 29 to May 12.

Plant Records:

Melilotus indica; Prosopis juliflora.

The species appears to have a similar distribution to that exhibited by most other members of this group, being found throughout the deserts of California, Lower California, Sonora, Chihuahua New Mexico and western Texas. It has not as yet been collected in Arizona but I attribute this to incomplete collections.

The type is located in the collection of T.D.A. Cockerell.

Colletes solitarius Timberlake

solitarius TIMBERLAKE, 1951, Wasmann J. Biol., vol. 9, p. 216.

In the introduction to the original description of this species Timberlake states that it is a probable member of the hyalinus group and resembles C. lutzi and C. phaceliae closely. This contention is apparently based on the punctation of the clypeus and the supra-clypeal area, which are closely punctate, some of the punctures tending to be striate. While the clypeal puncturation of this species is not typical of other members in the daleae group, it represents only one non-conforming feature

among the many other salient characteristics of that group. The antennae are short and strongly tinged with yellowish or very light brown below, the flagellar segments are no more than three-quarters as long as broad; the malar space is long, much longer than any members of the hyalinus group, being approximately one-half as long as broad; the prethoracic spines are very short, almost vestigial; the propodeum has the basal area sloping ventrally and very obscurely pitted, the pits barely distinguishable, the lateral and the posterior faces shiny, smooth, and distinctly punctate with punctures two to four puncture widths apart; the wings tend to whitish hyaline; the metasomal terga have the apical margins light brownish to almost yellow hyaline; the first metasomal tergum is shiny, very finely and sparsely punctate; the pile of the discs of metasomal terga one to six is light to tawny grey. On the basis of the aforementioned characters I would consider this species to undoubtedly be a member of the daleae group.

FEMALE: length 9 mm., wing length 6.75 mm.

Pile of face is long, rather dense, and white about antennal bases and along inner orbital margins, a few long, white hairs overhanging basal area of clypeus; vertex with pile pale grey to dusky, concentrated principally in ocellar triangle; upper genal areas with pile pale grey, becoming longer, finer, and pure white below, a broad band

of appressed, white pubescence immediately posterior to each compound eye; mesoscutum with pile dusky, sparse, and most dense over anterior and lateral margins; scutellum with a narrow lateral and posterior fringe of dusky pile; mesepisterna with pile long, fine, and white; propodeum with dense fringes of long, whitish pile of latero-posterior margins, fringes most dense and longest above, becoming shorter and sparser below, lateral and posterior faces with a sparse covering of whitish pile, tending to become semi-appressed on lateral faces; legs with pile sparse, long, and white, tinged with light yellow on posterior femora and tibiae; first metasomal tergum with apical fascia weak and whitish, apical portion of segment easily visible through sparse covering, especially medially, lateral fringes of white pile extending to apical fascia, disc with abundant, erect, whitish pile, particularly on extreme anterior face; metasomal terga two to four with fasciae broad, weak, and white, tending to be broadened medially and on extreme lateral faces; second metasomal tergum with a weak yet broad basal fascia of white pubescence; metasomal terga three and four with basal fasciae weak and much broader than that of second tergum, partially obscuring entire discal area of tergum four; metasomal terga four to six with pile of discal areas intermixed with erect, long, pale grey to light fuscous; metasomal sterna with a few longer, pale grey hairs on extreme apical portion.

Antennae short, yellowish brown below to becoming deep brown to black above, flagellar segments three-quarters as long as broad; malar space one-half as long as broad; clypeus weakly convex, rather densely punctate over basal three-quarters, punctures one-half to one and one-half puncture widths apart, separated by shiny interspaces, punctures for most part round, tending to be very slightly striated, particularly laterally; vertex shiny, sparsely punctate; fascial foviae very narrow, obscure, not extending above inner orbital margins. Prothoracic spines short, vestigial; mesoscutum densely punctate over anterior one-half and lateral margins, punctures one-half to one puncture width apart, impunctate area large; mesoscutum rather densely punctate about extreme lateral and posterior margins, punctures not at all roughened but with shiny, linear interspaces, disc shiny, sparsely punctate on posterior half, punctures one to three puncture widths apart, anterior one-half shiny, impunctate; mesepisterna deeply punctate, punctures one-half to one puncture width apart, being more dense above, interspaces shiny; propodeum with basal area weakly sloping ventrally, shallowly and irregularly pitted with pits tending to become elongate and obscure medially, lateral and posterior faces shiny and sharply punctate, punctures one to three puncture widths apart; tegulae light brownish hyaline; wings sparsely covered with light fuscous pile, nervures light brown; legs deep brown to black; posterior basitarsi three and three-quarters

times as long as broad. First metasomal tergum shiny, very finely and sparsely punctate, punctures almost folliculated, three to four puncture widths apart; second metasomal tergum shiny, finely, irregularly folliculated, follicles much more dense than on first metasomal tergum; metasomal terga one to five with fascial depression light yellow brown; metasomal sterna shiny, rather coarsely and sparsely folliculated, particularly on apical portions of each sternum.

Distribution:

Holotype, female, Lone Pine, Inyo County, California, May 23, 1937 (E.C. Van Dyke).

The type is in the collection of the California Academy of Sciences.

The holotype has the pubescence of the metasomal terga rather obscure, probably due to moistening, and the exact pubescent covering is a little difficult to discern.

GROUP XVII - aridus

Colletes aridus Stephen, new species

This species appears to be most closely related to scopiventer Swenk, but I have no males of scopiventer with which to make further comparisons. The males have a short

malar space, one-third as long as wide, no dark pile on the body, an impunctate first tergum, and white sternal fasciae. The females differ from scopiventer in having no dark pile on the thoracic dorsum, shorter prothoracic spines, and much narrower fascial foviae, particularly dorsally.

MALE: length 7.5 mm., wing length 6 mm.

Pile of face dense about antennal bases, supra-clypeal area, and along inner orbital margins, being rather sparse over clypeus; vertex with sparse, fine, pale grey pile; upper genal areas with pile long, fine, and white to pale grey, becoming much longer and whiter below; mesoscutum with pile very long, ragged, and tinged with light ochreus, a few darker hairs, not black, intermixed on median discal area; scutellum with pile very long and tinged with light ochreus, a few darker hairs intermixed; mesepisterna with pile long, fine, and white; propodeum with dense fringes of long pile tinged with ochreus at dorsal latero-posterior margins, lateral and posterior face with abundant, long, fine, pale grey pile; pile of legs short, sparse, and pale grey first metasomal tergum with a weak fringe rather than a fascia of white pile along apical margin, often interrupted medially, lateral fringes of white pile not complete or weakly complete to apical fascia, fringes very weak, disc with sparse, erect, whitish pile; metasomal terga two to five with fasciae narrow, dense, and white; metasomal terga three to six with discs having abundant, erect, light fulvous to whitish pile; metasomal sterna

with apical margins having a fringe of short, light ochreous pile.

Antennae short, deep brown to black, flagellar segments approximately as long as wide; malar space one-third as long as broad; clypeus very weakly convex and short with surface rather closely and densely punctate over basal one-half, punctures becoming sparser, more striate, and slightly coarser apically; vertex dull, rather closely punctate. Prothoracic spines very short and sharp; mesoscutum finely and densely punctate over anterior one-third and extreme lateral margins, impunctate area very large, extending well up to median line of the mesoscutum; scutellum sparingly punctate, almost impunctate, a few scattered, coarse punctures on discal area; mesepisterna rather densely punctate and dull above, punctures no more than one puncture width apart, becoming finer and much sparser, with broad shiny interspaces, below, punctures one to two puncture widths apart; propodeum with basal area sloping sharply ventrally, basal area with longitudinal, shallow, quadrate pits, lateral and posterior faces dull and roughened; tegulae deep hyaline brown; wings dusky with rather sparse, fulvous pubescence, nervures brown; legs black; posterior basitarsi three and three-quarter times as long as broad. First metasomal tergum shiny, black tinged with a metallic blue lustre, very sparsely punctate or coarsely folliculated, with punctures two to six puncture widths apart; second metasomal tergum shiny, tinged with a

metallic blue lustre, but with punctures a little more close than on the first tergum, the tergum with a sharp basal depression; metasomal sterna dull, very densely and finely folliculated; seventh ventral plates distinctive, almost linear in their lateral expansion, with median directed processes (See Fig. 75).

FEMALE: length 8.5 mm., wing length 6.25 mm.

Pile of face short and rather dense about antennal bases and particularly along lower inner orbital margins; vertex with abundant, pale grey pile; upper genal areas with pile dense, short, and pale grey becoming finer, longer, and whiter below, with a weak margin of appressed, white pubescence immediately posterior to compound eyes; mesoscutum with pile short, dense, and clumped principally on anterior and lateral margins, pile with no black hairs intermixed; scutellum with pile tinged with grey to ochreous about extreme lateral and posterior margins; mesepisterna with pile long, fine, dense, and white; propodeum with dense fringes of long, pale grey pile on lateral posterior margins extending from upper surface down to pedicle, posterior face with abundant, long, fine, pale grey pile; legs with pile rather short and sparse on first two pair, becoming long, plumose, and tinged with yellowish to pale grey on posterior femora and tibiae; first metasomal tergum with a narrow, dense, white apical fascia, narrowed medially, lateral fringes of pile short

and weak, barely extending to apical fascia, disc with sparse, short, pale grey pile; metasomal terga two to five with fasciae very broad, white, and dense; metasomal terga three to five with discs having abundant, erect, light fulvous to pale grey pile, not concealing surface; metasomal sterna two to five with abundant, erect, light ochreous pile, forming a strong scopa.

Antennae deep brown, flagellar segments one-half as long as broad; malar space short, one-eighth as long as broad; clypeus weakly convex, rather sparsely punctate with shiny interspaces, punctures one-half to two puncture widths apart over surface, tending to lie in longitudinal rows, especially laterally; vertex shiny with a few, fine punctures; fascial foviae deep, broadened medially, and narrowed abruptly above, extending less than one-third of way from compound eyes to lateral ocelli. Prothoracic spines very short and sharp; mesoscutum rather densely and finely punctate on anterior one-third and about extreme lateral margins, impunctate area very large; scutellum shiny, discal area very sparsely punctate with a few, coarse punctures; mesepisterna finely and densely punctate, punctures no more than one puncture width apart, interspaces shiny; propodeum with basal area obscurely, quadrately pitted with elongate, quadrate pits, sloping sharply ventrally, lateral and posterior faces dull and roughened; tegulae brownish hyaline; wings dusky with abundant,

fulvous pubescence, especially apically, nervures dark brown; legs black; posterior basitarsi three times as long as broad. First metasomal tergum shiny, virtually impunctate except for a few, sparse, scattered follicles; second metasomal tergum much as first, with a little more dullish cast, very sparsely and finely folliculated; metasomal sterna dull, very densely and finely folliculated, last metasomal sternum with apical one-third sharply depressed and free of pile.

Distribution:

Holotype male, allotype female and one female paratype; Comstock, Texas, April 13, 1949 (Michener, Beamer) on Phacelia popei; additional paratypes: 6 males, McCamey, Texas, April 10, 1949 (Michener, Beamer); one male, Langtry, Texas, March 27, 1946 (C. D. Michener); one male, one female, Milagro, New Mexico, June 23, 1941 (L. H. Banker); one female, Vaughn, New Mexico, June 17, 1940 (T. B. Mitchell).

The holotype and allotype are in the Snow Entomological Collections of the University of Kansas,

GROUP XVIII - titusensis

Colletes titusensis Mitchell

titusensis MITCHELL, 1951, J. Elisha Mitchell Sci.

Soc., vol. 67, p. 237.

This species was described by Mitchell from a single male taken at Titusville, Florida. The present paper includes a description of a female taken at Tampa and designated as the neallotype. The species is temporarily placed near the consors group on the basis of the short antennae in both sexes, and the apical depression of the last sternum of the female. This is a tentative placement because many of the characteristics are not typical of the consors group. The penis valves have no dorsal wing. The eyes are very large and the mesepisterna rugosely punctate; the clypeus is short and densely and coarsely punctate; and the first metasomal tergum is shiny and weakly folliculated; the malar space is approximately one-eighth as long as broad in the male and linear in the female. In the female the scopa is moderately dense with dark pile on the mesoscutum and scutellum.

MALE: length 8.5 mm., wing length 6 mm.

Pile of specimen is matted and much has been removed, making a description of the amount of pile and its colour difficult. Face with sparse, erect, light ochreous pile, appearing to conceal clypeus; vertex with a few, pale grey hairs, particularly in ocular triangle; upper genal areas with pile long, fine, and pale grey, becoming slightly longer yet sparse and much whiter below; pile of mesoscutum sparse, fine, and pale grey on anterior one-half; appearance

of a few darker hairs on discal area of scutellum (but difficult to discern because of the condition of the specimen), a fringe of pale grey pile about peripheral margin of scutellum; mesepisterna with sparse, long, fine, pale grey pile; propodeum with weak fringes of pale grey pile on postero-lateral margin, posterior and lateral faces with sparse, fine, erect, white hairs; pile of legs sparse, fine, and pale grey; metasomal terga with fasciae absent in male specimen but evidence of weak fasciae on lateral margins of terga two to five; metasomal sterna with weak apical fringes of whitish pile, fringes apparently interrupted medially.

Antennae deep brown to black, short, flagellar segments as long as broad; malar space one-eighth as long as broad; clypeus weakly convex, very densely and finely punctate over entire surface, punctures not rugose or striate; vertex shiny, sparsely punctate, compound eyes extremely large. Prothoracic spines short and sharp, shorter than width across base; mesoscutum densely punctate with punctures less than one puncture width apart over anterior two-thirds, impunctate area absent; scutellum densely punctate over posterior one-half, punctures sparse medially and absent on anterior margin; mesepisterna coarsely, contiguously punctate; metapleuron with a weak process above, similar to that in americanus group, a very narrow, indistinct, black rim; propodeum with basal area narrow and deeply quadrately pitted, lateral faces dull, roughened and weakly

rugose near latero-posterior margins, posterior face with many coarse rugae or striae, forming weak, longitudinal pits over the surface; tegulae deep brown; wings dusky, very densely covered with fulvous pubescence, nervures brown; legs black; posterior basitarsi three and one-half times as long as broad. First metasomal tergum shiny, very finely punctate, punctures follicle-like, much denser and finer on apical one-third, punctures one to four puncture widths apart on median discal area; metasomal tergum two shiny and sparsely folliculated; metasomal sterna shiny and very finely roughened; seventh ventral plates roughly quadrate with apical ends divergent, weakly plumose over apical one-third, the plates weakly hyaline; capsule of penis valves lacking a dorsal convolution, lateral portion of the volsellae much longer than medial rounded portion.

FEMALE: length 9 mm., wing length 6.5 mm.

Pile of face short, erect, and white; scattered white pile over clypeus; pile of vertex pale grey; upper genal areas with pile pale grey, becoming longer and whiter below, a weak fringe of appressed pubescence behind each compound eye; pile of mesoscutum short and white over anterior and lateral margins, strong admixture of black pile on median discal area; scutellum with a lateral fringe of pale grey to light ochreous pile, discal area with abundant, erect, black pile; mesepisterna with pile long,

fine, and white; propodeum with dense fringes of pale grey pile on the upper latero-posterior margins, lateral face with pile pale grey; erect, and sparse; pile of legs dense, long, white to pale grey; first metasomal tergum with a narrow apical fascia of white pile, very weak lateral fringes of pale grey pile extending to apical fascia, anterior face of disc with a few erect, short hairs; metasomal terga two to five with weak fasciae of short, white pubescence, discal areas with pile fulvous to pale grey; metasomal sterna with abundant, erect, discal pubescence forming a weak scopa.

Antennae brownish black, flagellar segments one-half as long as broad; malar space linear; clypeus weakly convex, very densely punctate over entire surface, punctures not striate or rugose; vertex shiny, sparsely punctate with shiny interspaces; fascial foviae narrow, broadened slightly medially, deep and impunctate. Prothoracic spines very short, slightly shorter than width across base; mesoscutum coarsely punctate, punctures approximately one-half to one puncture width apart about anterior half and lateral margins, impunctate area small; scutellum with punctures of discal area coarse, approximately one puncture width apart, becoming sparser and finer anteriorly; mesepisterna finely, densely, contiguously punctate, dull; metapleuron with a weak dorsal protuberance similar to that of the americanus group, with a very narrow, light rim (this is evident only with difficulty); propodeum with basal area deeply,

quadrately pitted, lateral faces dull and roughened, posterior face weakly roughened and dull; tegulae deep brown; wings dusky, densely covered with fulvous pubescence, nervures brown; legs deep brown to black; posterior basitarsi four times as long as broad. Metasomal terga one and two shiny, sparsely folliculated; metasomal sterna dull, rather densely and finely folliculated over the posterior three-quarters of each tergum, extreme apical margins of metasomal terga one to five with a light hyaline rim; last metasomal tergum with apical one-half depressed, shiny, and non-pubescent with an apical fringe of long, fulvous pile.

Distribution:

Florida: Titusville, April 25, 1923 (holotype in American Museum of Natural History); Tampa (neocallotype in the United States National Museum.)

GROUP XIX - longifacies

Colletes longifacies Stephen, new species

The position of this species, based on two females, one complete, the other lacking an abdomen, is uncertain. The head and thorax resemble those of latitarsis, while in other features it closely resembles the productus group. The female can be readily distinguished from its closest

species in having the malar space three-quarters as long as broad; the clypeus very long and flattened with a very sharp, longitudinal median sulcus; the first metasomal tergum shiny, impunctate; and a strong admixture of black or dark pile on the mesoscutum, scutellum, and vertex. The posterior basitarsi are long and slender, not as in the latitarsis group.

FEMALE: length 10.5 mm., wing length 6.75 mm.

Pile of face erect and white to pale grey about antennal bases and along inner orbital margins, pile tending to become somewhat appressed along lower inner orbital margins; pile of vertex tinged with ochreus and intermixed with a few dark and black hairs; upper genal areas with pile long, fine, and pale grey becoming much longer, finer, and whiter below, a very weak rim of short, appressed, white pubescence immediately posterior to each compound eye; mesoscutum with pile pale grey to dusky, concentrated principally on anterior one-half and lateral margins, disc with a strong admixture of dark and black hairs; scutellum with a lateral and posterior fringe of dusky, dark, and black pile, black predominating toward median discal area; mesepisterna with pile long, fine, and pale grey to white; propodeum with long fringes of pale grey pile along latero-posterior margins, pile long and dense on dorsal surfaces; pile of legs short on anterior two pairs to long, plumose, and tinged with ochreus on posterior legs, posterior tibiae with a strong admixture of deep

ochreous to black pile on upper surface; first metasomal tergum with apical fascia broad and white, interrupted medially, lateral fringes of white pile barely reaching apical fascia, disc with extreme anterior face having abundant, erect, white pile; metasomal terga two to four with fasciae broad, dense, and white; second metasomal tergum with a distinct, white, basal fascia; metasomal terga three to five with discs having a very weak covering of short, light pile; metasomal sterna two to four with apical fringes of tawny pile often interrupted medially.

Antennae reddish brown, flagellar segments just barely longer than broad; malar space three-quarters as long as broad; clypeus long and flattened, with a sharp longitudinal median sulcus extending from base to apex, the surface dull and very sparsely, shallowly punctate, punctures most dense about fronto-clypeal margins and along median depressed area, punctures one to three puncture widths apart, being very sparse on apical and latero-apical margins; vertex finely and rather densely punctate with shiny interspaces; fascial foviae deep and broadly triangular, dorsal margin pointed, just barely reaching above inner orbital margins. Prothoracic spines stout and sharp, approximately one and one-half times as long as width across base; mesoscutum densely punctate about anterior one-half and extreme lateral margins, punctures one-half to one puncture width apart, impunctate area small; scutellum densely, contiguously punctate about lateral and posterior edges, punctures

becoming more distinct on median discal area where they are no more than one-halfpuncture width apart, extreme anterior margin shiny, impunctate; mesepisterna densely and coarsely punctate, punctures almost contiguous above to one-half puncture width apart below, punctures tending to become somewhat obscure on lower and posterior margins; propodeum with basal area broad, shallowly, quadrately pitted, lateral and posterior faces shiny and very finely roughened; tegulae brownish hyaline; wings dusky with abundant, fulvous pubescence, nervures brown; legs brown to reddish brown; posterior basitarsi four and one-quarter times as long as broad. First metasomal tergum shiny, impunctate, very finely and sparsely folliculated on lateral margins; second metasomal tergum finely and rather densely folliculated; metasomal sterna shiny, finely and densely folliculated on apical half of sterna two to four.

Holotype (and 1 paratype), female, De Funiak Springs, Florida, October 17-19, 1914, paratype with the abdomen missing.

The type is located in the American Museum of Natural History.

ADDENDA

The species of uncertain position (bradleyi, nitidus) and those species represented by single non-determinable females (delodontus, stricklandi, trigonatus, utilis) are grouped alphabetically on the following pages. This is a provisional placement for many of the species but considerable work must be done before their status can be clarified.

Colletes bradleyi Mitchell

bradleyi MITCHELL, 1951, J. Elisha Mitchell Sci. Soc., vol. 67, p.239.

At the present time I can add little to the knowledge concerning the relationship of this species, except to state that it is a member of the americanus group. As specimens were not available to me when the keys were being constructed, the species is not included in the key.

"Female -- Length 9 mm.; length and breadth of face sub equal; eyes converging below; malar space very short, linear; fascial foveae well developed, subtriangular, rounded above, broad medially, more pointed below; antennae ferruginous beneath, length and breadth of mid antennal segments subequal; clypeus produced but very slightly below suborbital line, shining, deeply and rather coarsely and closely punctate; supraclypeal area shining and impunctate medially, becoming finely and closely punctate laterally; face above antennae rather dull, punctures irregular, rath-

er shallow, interspaces tessellate; vertex shining punctures scattered, very minute; cheeks closely and very finely punctate; pubescence of head and thorax entirely pale, whitish below, more creamy above; lateral angles of prothorax not spined; metapleural prominence carinate, margin of the carina narrowly testaceous; anterior coxal spines lacking; tarsi slightly reddened but not contrasting tibiae or femora, length of hind metatarsi about three times their breadth; tegulae ferruginous; wings subhyaline, violaceous, nervures and stigma ferruginous; third submarginal cell slightly exceeding the second, the latter receiving first recurrent nervure slightly basad of middle, the third receiving the second recurrent about one-fourth from tip; thorax shining, punctures of mesonotum fine and quite sparse, even anteriorly, becoming more sparse and slightly more coarse and deep posteriorly; punctures of scutellum much more coarse, close posteriorly, becoming fine and sparse anteriorly; punctures of pleura deep, rather coarse, well separated but not sparse; lateral faces of propodeum somewhat shining, obscurely punctured posteriorly, dorsal face divided into eight or nine shining pits by the lateral striae; basal abdominal tergum shining, finely but distinctly punctate, punctures well separated but not sparse, following segments becoming more finely and closely punctate; apical margins not appreciably depressed but reddish-hyaline beneath the entire rather narrow but dense white fasciae, discal pubescence

erect, very short and thin, faintly brownish.

"Holotype: Female, Chatsworth, Burlington Co., N.J., June 15, 1923 (J. C. Bradley) [Cornell Univ.]. Paratype: 1♀, Chesilhurst, N.J., June 3, 1939 (H. K. Townes) [author's coll.]"

Colletes delodontus Viereck

delodontus VIERECK, 1903, Trans. Amer. Ent. Soc., vol. 29, p. 59; SWENK, 1904, Canadian Ent., vol. 36, p.94; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p.291; CRESSON, 1928, Mem.Amer. Ent. Soc., vol. 5, p.59.

"Labrum with a round dent at base in the middle with a pair of faint impressions laterally. Space between eyes and base of mandibles apparently less than half the width of the latter at base. Prothoracic spines rudimentary.

"Female Length 10 mm. - Front with coarse, closely arranged punctures, on vertex they are much finer and sparse. Cheeks indistinctly punctured, shining like rest of head. Clypeus with coarse, large elongate punctures creating a longitudinal appearance. Dorsulum with deep, large punctures as closely arranged as possible on the anterior half which is dull. On the posterior half the punctures are scattered on a polished area. Scutellum punctured much as anterior half of dorsulum, sculpture of postscutellum hidden by the pubescence. Mesopleurae shining with close deep punctures. Superior disc of metathorax bounded by

distinct ridge. The longitudinal divisions defined by strong ridges, the spaces longer than wide, polished. The enclosure funnel shaped with a broad neck, smooth and shining. The rest of metathorax roughened subopaque. Pubescence of face, cheeks, pleurae, legs, to the tarsi and basal segment of abdomen pale, grayish. Head and thorax dorsally rather thickly covered with a dull pubescence, tinged with ochreous. Wings clear, nervures dark brown, costal, subcostal and stigma almost black. First recurrent nervure received by the second submarginal cell at the middle. First abdominal [tergum] with fine well separated punctures on a smooth shining surface, on the second segment the surface is the same as on the preceding, the punctures closer, the rest of the segments duller, having no distinct punctuation. Apex of abdomen with brownish hairs.

"Black. Claws very dark brown.

"Type. Coll. Acad. Nat. Sciences, Phila. Type locality, Beulah, N.M., August 25, 1899 (W.P. Cockerell). Paratype - End of August 1899 (T.D.A. Cockerell), two females. Two females, Roripa nasturtium, June 29, 1902 (Viereck). These specimens have the pubescence paler, whitish and appressed pubescence at bases of second and third abdominal segments. One is 8 mm. long and has the labrum dull instead of shining."

Colletes nitidus Smith

nitidus SMITH, 1879, Desc. new species Hymenoptera in the British Mus., p. 1; VIERECK, 1902, Canadian Ent., vol. 34, p. 330; VIERECK, 1903, Ent. News, vol. 14, p. 120; COCKERELL, 1904, Ent. News, vol. 15, p. 276; SWENK, 1908, Univ. Nebraska Studies, vol. 8, p. 36.

"(Female: length 5 lines - Black; the pubescence white; that on the thorax above slightly tinged with yellow; the abdomen very bright, smooth and shining. The clypeus strongly punctured; the flagellum of the antennae fulvous beneath towards the apex. Thorax shiny and punctured; wings hyaline and iridescent, the nervures fusc-ferruginous. Abdomen impunctate at the base and very finely punctured towards the apex; the apical margin of each segment, except the basal one, with a white pubescent fascia.

"Male: A little smaller than the female, of the same jet-black colour, with similar white pubescence, and the same bright polished abdomen; the latter is oblong-ovate in the male, and of conical shape in the female, the apex being pointed. Hab. East Florida)"

Despite efforts on the part of Dr. I.H.H. Yarrow of the British Museum, I was unable to have this species located and compared. As discussed elsewhere in this paper it may well prove to be the same as carolinus Mitchell.

Colletes stricklandi Cockerell

stricklandi COCKERELL, 1938, Canadian Ent., vol. 70,
p. 70.

"Female. Length about 10 mm, anterior wing 7.2; black including mandibles, antennae (flagellum very faintly reddish beneath) and legs; hair on head and thorax above, including tubercles, light yellowish fulvous (a little brighter than in the last species i.e. eulophi albertensis Ckll.) of sides of face, cheeks and under side of thorax dull white; head broad, eyes strongly converging below; malar space fully twice as broad as long; labrum shining with several pits; clypeus shining, very coarsely sculptured, the lower part striate, the middle with a sulcus; supraclypeal area prominent, with few punctures; third antennal joint a little longer than the fourth; mesothorax well punctured except on disc, which is smooth and shining; prothoracic spine almost hidden by hair; scutellum shining anteriorly; base of metathorax with a very strong transverse keel, above which is the usual series of plicae, the intervals between them longer than broad; lower part of area polished, but posterior truncation coarsely sculptured and dull; tegulae very dark brown; wings hyaline, stigma dark reddish, well developed, extending into marginal cell (a character separating it from C. cauponarius Ckll.); nervures very dark brown; second cubital cell very broad, receiving first recurrent nervure in middle; legs with dull

white hair, faintly yellowish on inner side of hind tarsi; spurs red; front coxae not spined; abdomen shining its hair yellowish white, nearly cream-colour, long and abundant on basal part of first tergite, forming dense entire bands of tomentum on margins of tergites 1 to 5 (weak in middle on first), but no band on base of second; first tergite strongly and conspicuously punctured, the punctures running more or less in rows; second with smaller, closer punctures, third punctured like second; hind margins of tergites not red; hair bands of venter weak.

"Alberta: Lethbridge, July 20, 1933 (E.H. Strickland). In Robertson's table of Illinois species this goes to C. eulophi Rob., from which it is readily known by the absence of a basal band on second tergite, the more closely punctured first tergite, and the much darker stigma. The abdominal punctures distinguish it from C. kincaidii Ckll., which is also a larger species (about 13 mm.)."

Colletes trigonatus Cockerell

trigonatus COCKERELL, 1933, Ann. Ent. Soc. America, vol. 26, p. 42; TIMBERLAKE, 1943, Bull. American Mus. Nat. Hist., vol. 81, p. 394.

"Female. Length about 10 mm.; black, robust, the head and thorax with abundant long erect hair, which is very pale yellowish (without any dark hairs), white on cheeks and

under side of thorax; mandibles black, flagellum very obscurely brownish beneath; face broad, orbits strongly converging below; malar space fully twice as broad as long; disc of clypeus strongly elevated, but flattened, with an irregular median channel, the whole surface very coarsely sculptured with striae and punctures; supraoclypeal area presenting an elevated triangular surface, polished but grooved, its upper end acute and narrowed to a keel; third antennal joint much longer than fourth, but not as long as next two together, suture between third and fourth joints on under side deeply incised; mesothorax strongly and closely punctured, but posterior middle with a polished impunctate space; posterior truncation of metathorax with long hair; tegulae dark reddish, wings hyaline, stigma and nervures black or nearly so, costa and subcosta both black; basal nervure not nearly reaching nervulus; second cubital cell very broad, receiving recurrent nervure slightly beyond middle; third cubital receiving second recurrent not far from end; eleven reddish hooks on hind wing; legs ordinary, anterior coxae unarmed; abdomen shining, with small but distinct punctures, hind margins of tergites very narrowly rufous; punctures of third tergite very much smaller and closer than on first; abdominal bands dense and clear white, broad and entire, on margins of tergites 2 to 4 (apparently abraded on fifth); first tergite with small white patches at sides of margin; second with a hair-band at extreme base, probably often concealed.

"Colorado: Pingree Park, August 15, 1932, (Helen James). Very like C. eulophi Rob., the punctures of abdomen about the same, but differs by dark tegulae and stigma, and longer hair on thorax above."

Colletes utilis Cockerell

utilis COCKERELL, 1897, Ann. Mag. Nat. Hist., ser. 6, vol. 19, p. 39; COCKERELL, 1897, Bull. New Mexico Agric. Exper. Sta., no. 24, p. 24; COCKERELL, 1898, Bull. Denison Univ., vol. 11, p. 42; COCKERELL, 1898, Bull. Univ. New Mexico, vol. 1, p. 42; COCKERELL, 1906, Trans. Amer. Ent. Soc., vol. 32, p. 292.

"Female: Length 11 millim., anterior wing $7 \frac{2}{3}$ millim. Stoutly built, black; the rather long pubescence of face, cheeks, pleura, base of abdomen and legs greyish white or very pale grey, that of vertex and dorsum of thorax yellowish ochraceous. Face broad, with erect pale grey pubescence except on clypeus and middle of supraclypeal area, which are bare. Clypeus with elongate irregular punctures, the surface between them striate, the sculpture reminding one of the surface of a strawberry. Supraclypeal area shining, with two longitudinal rows of large subconfluent punctures on each side. Vertex very closely and distinctly punctured. Space between eyes and base of mandibles about twice as broad as long. Mandibles black, with a dark

rufous ring, tips blunt, notch a fair distance from tip. Labrum with three or four short longitudinal grooves on each side; no central pit. Antennae wholly dark, flagellum with a very fine sericeous pubescence, first joint of flagellum distinctly longer than second. Thorax quite densely pubescent above; prothoracic spine horizontal, long and slender, easily overlooked amidst the pubescence. Mesothorax moderately shiny, median groove very well marked; punctures very large and distinct, separated from each other by intervals about equal to the diameter of one. Pleura shiny with strong punctures. Enclosure at base of metathorax very short, coarsely longitudinally plicate, bounded behind by a straight transverse keel. Tegulae rufo-testaceous. Wings perfectly hyaline, nervures and stigma black. Legs entirely dark, the claws only rufescent, spurs pale brownish. Basal joints of tarsi fairly but not remarkably stout. Pubescence at tips of inner side of tarsi more or less rufous. Punctuation of first two segments strong and rather close, on a shining surface; of third extremely fine and small, on a microscopically tessellate surface. No hair-bands, but base of first segment with long hairs. Hind trochanters with a thin, long curled brush of beautifully ramose hairs.

"Hab. Las Cruces, N.M., March 23, on flowers of plum."

ACKNOWLEDGEMENTS

I am exceedingly grateful to Dr. C.D. Michener for the unlimited cooperation and guidance given by him throughout the preparation of this paper.

Thanks are due to the following collectors and museum curators who have lent so generously of material of their own or of specimens in their charge: R.D. Bird, G.E. Bohart, W.H. Brittain, E.A. Chapin, P.J. Darlington, R.R. Dreisbach, G.P. Holland, M.T. James, G.F. Knowlton, K.V. Krombein, E.G. Linsley, K. MacArthur, A.T. McClay, T.B. Mitchell, M.H. Muma, J.A.G. Rehn, H.J. Reinhard, H.H. Ross, H.G. Rodeck, H.F. Schwarz, H.A. Scullen, H.E. Strickland, and P.H. Timberlake. I am especially indebted to Mr. P.H. Timberlake and Dr. T.B. Mitchell for the unrestricted use of their manuscripts and manuscript species.

Acknowledgement is also due Miss M. McCowan for the preparation of the typescript, Mr. A. Goodson for the inking of the drawings, and Mr. J.T. Robertson for the photographic assistance rendered.

I owe many thanks to the Division of Entomology, Canada, Department of Agriculture, for their acceptance of this work as one of their projects and for permission to complete it while in their employ.

REFERENCES CITED

- Arnold, G.
1947. A key to the African genera of the Apidae.
Jour. Ent. Soc. South Africa, vol. 11, pp.
193-218.
- Bischoff, H.
1930. Beitrag zur Kenntnis paläarktischen Arten der
Gattung Epeolus. Deutsche Entom. Zeitschr.,
pp. 324-331.
- Blair,
1920. *Bombylius minor* L. and some other parasites
or inguines of *Colletes daviesana* Sm. Ent.
Monthly Mag., vol. 56, pp. 200-202.
- Crampton, G.C.
1919. The genitalia and terminal abdominal structures
of the males, and the terminal abdominal struc-
tures of the larvae of "Chalastogastrous"
Hymenoptera. Proc. Ent. Soc. Washington, vol.
21, pp. 129-148.
1920. A comparison of the genitalia of male Hymenop-
tera, Mecoptera, Neuroptera, Diptera, Trichop-
tera, Lepidoptera, Homoptera and Strepsiptera,
with those of lower insects. Psyche, vol. 27,
pp. 34-45.
- 1920(a). Remarks on the basic plan of the terminal
abdominal structures of the males of winged
insects. Canadian Ent., vol. 52, pp. 178-183.
1938. The structures called parameres in male insects.
Bull. Brooklyn Ent. Soc., vol. 33, pp. 16-24.

- Cresson, E.T.
1887. Synopsis of the families and genera of the
Hymenoptera of America, north of Mexico. Trans.
American Ent. Soc. (suppl.), vi + 351 pp.
- Crosskey, R.W.
1951. The morphology, taxonomy, and biology of the
British Euclyptidae (Hymenoptera). Trans. R.
Ent. Soc. London, vol. 102, pp. 247-301.
- Dalla Torre, C.G. de
1896. Catalogus hymenopterorum, vol. 10. Leipzig,
viii + 643 pp.
- Else, F.L.
1934. The developmental anatomy of the male genitalia
in *Melanoplus differentialis* (Locustidae,
Acrididae, Orthoptera). Jour. Morph., vol. 55,
pp. 577-609.
- Friese, H.
1912. Die Siedenbienen (*Colletes*) von Zentraleuropa.
Arch. Naturg. 78 Jhrg. 1912 Abt. A.S., pp.
149-161.
1921. Nachtrag zur Bienenfauna von Costa Rica.
Stettiner Ent. Ztg., vol. 82, p. 83.
1922. Die europäischen Bienen: das Leben und Wirken
unserer Blumenwespen. vii + 456 pp., pls. 1-33.
- Griffin, F.J.
1935. In Richards, Notes on the nomenclature of the
Aculeata Hymenoptera. Trans. R. Ent. Soc.
London, vol. 83, p. 174.
1938. On the date of publication of Latreille (in

Sonnini's Buffon). An X [sic], Hist. nat.
gén. partic. Crust. Ins. 3, J. Soc. Bibliography
Natural Hist., vol. 1, p. 157.

1938(a). The date of publication of Kirby's "Monographia
Apum Angliae" 2 vols. 1802. J. Soc. Biblio-
graphy Natural Hist., vol. 1, p. 158.

Johannsen, O.A., and F.H. Butt
1941. Embryology of insects and myriapods. McGraw-Hill
Book Co., New York City. xi + 462 pp.

Latreille, P.A.
1802. Histoire naturelle des fourmis. 8 + 445 pp.
1802. Histoire naturelle générale et particulière
des crustacés et des insectes. vol. 3.

Malyshev, S.I.
1923. La nidification des Colletes Latr. Rev. Russe
Entom. T., vol. 18, pp. 103-124.
1927. Lebensgeschichte des Colletes cunicularius L.
Zeitschr. Morph. Oekol. Tiere. 9 Abt. A.
pp. 390-409.

Mayet, Valéry
1875. Mémoire sur les moeurs et les métamorphoses
d'une nouvelle espèce de Coleoptère de la
famille des vésicants le Sitaris colletis.
Ann. de la Soc. Ent. de France, ser. 5, vol.
4, pp. 65-94.

Michener, C.D.
1944. Comparative external morphology, phylogeny,
and a classification of the bees (Hymenoptera).
Bull. American Mus. Nat. Hist., vol. 82, pp.
157-326.

- 1944(a). A comparative study of the appendages of the eighth and ninth abdominal segments of insects. *Ann. Ent. Soc. America*, vol. 37, pp. 336-351.
1951. In Muesebeck et al. Hymenoptera of America north of Mexico, synoptic catalogue. United States Dept. Agric., Agric. Monograph No. 2, pp. 1044-1049.
- Morice, F.D.
1904. Illustration of the male terminal segments and armatures in thirty-five species of the Hymenoptera genus *Colletes*. *Trans. Ent. Soc. London*. 1904.
- Noskiewicz, J.
1936. Die Palearktischen *Colletes*-arten, *Prace Naukowe Wydawnictwo Towarzystwa Naukowego Lwowie*, ser. 2, vol. 3, pp. 1-532.
- Parker, J.B., and A.G. Boving.
1924. The blister beetle *Tricrania sanguinipennis* - biology, descriptions of different stages, and systematic relationship. *Proc. United States Nat. Mus.*, vol. 64, pp. 1-40.
- Radoszkowski, O.
1891. Révision des armures copulatrices des males du genre *Colletes*. *Horae Soc. Ent. Rossicae*, vol. 25.
- Rau, Phil and Nellie
1916. Notes on the behavior of certain solitary bees. *Jour. Anim. Behavior*, vol. 6, pp. 367-370.
- Schmiedeknecht, Otto
1882-1884. *Apidae Europaeae*. Tomus 1. Gumperde et Berolini.

Singh-Pruthi, H.

1929. Homologies of the genitalia of insects. Ent.
Monthly Mag., vol. 65, pp. 189-201.

Smith, J.B.

1900. In [the Minutes of meeting of December 19, 1899].
J. New York Ent. Soc., vol. 8, p. 208.
1901. Notes on some digger bees. J. New York Ent. Soc.,
vol. 9, pp. 30-36.

Snodgrass, R.E.

1941. The male genitalia of Hymenoptera. Smithsonian
Misc. Coll., vol. 96, no. 5, pp. 1-85.

Strohl, J.

1908. Die Copulationsanhänge der solitären Apiden u.
die Artentstehung durch "physiologische Isolierung".
Zool. Jahrb., Abt. Syst., vol. 26, pp. 333-384.

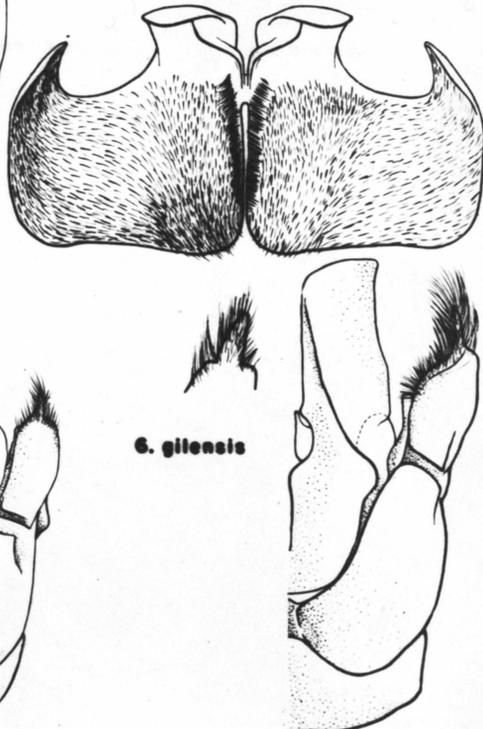
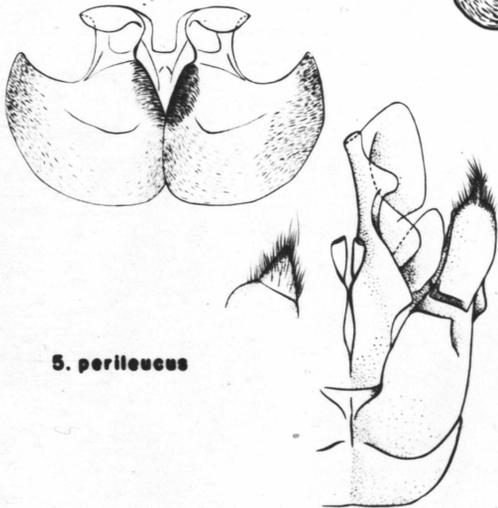
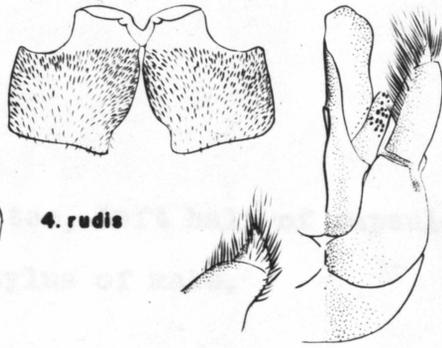
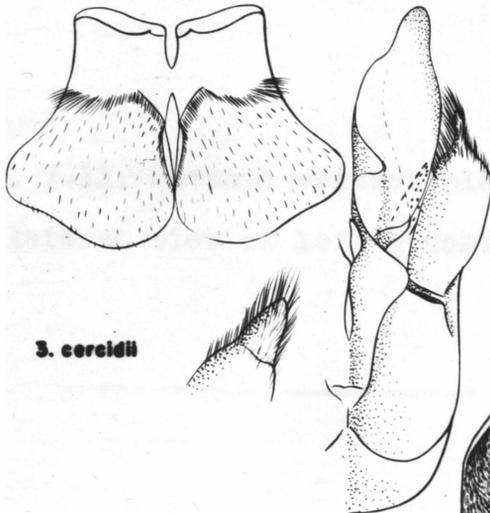
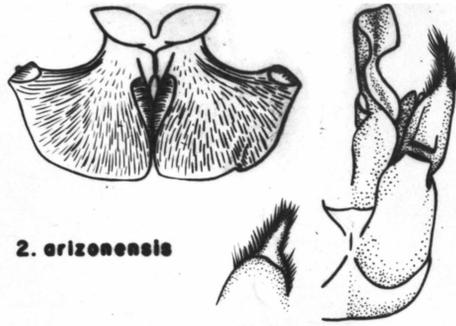
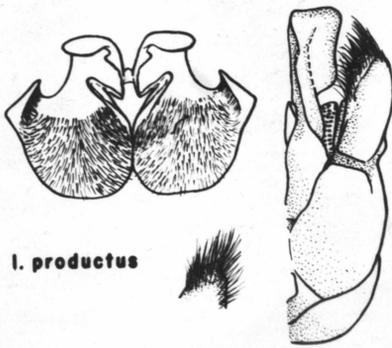
Swenk, M.H.

1908. Specific characters in the bee genus *Colletes*.
Univ. Nebraska Studies, vol. 8, pp. 43-60.

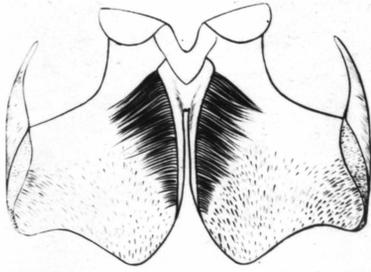
Timberlake, P.H.

1943. Bees of the genus *Colletes* chiefly from Colorado.
Bull. American Mus. Nat. Hist., vol. 81, pp.
385-410.
1951. Western bees of the genus *Colletes* (Hymenoptera,
Apoidea). Wasmann Jour. Biol., vol. 9, pp.
181-238.

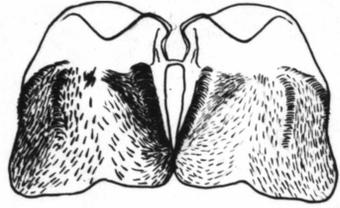
**Figs. 1-6. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



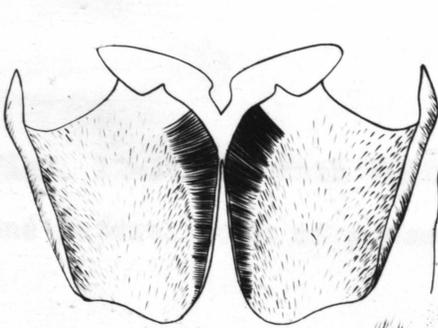
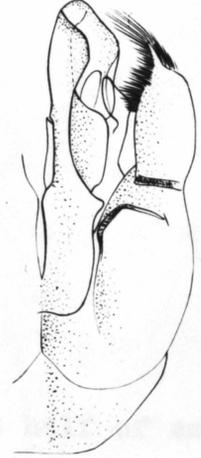
**Figs. 7-11. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



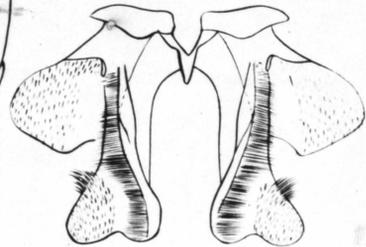
7. *skinneri*



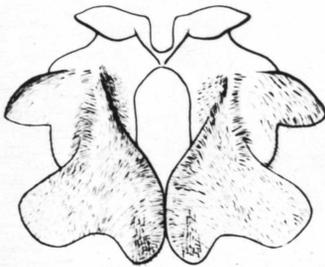
9. *compactus*



8. *vandykei*



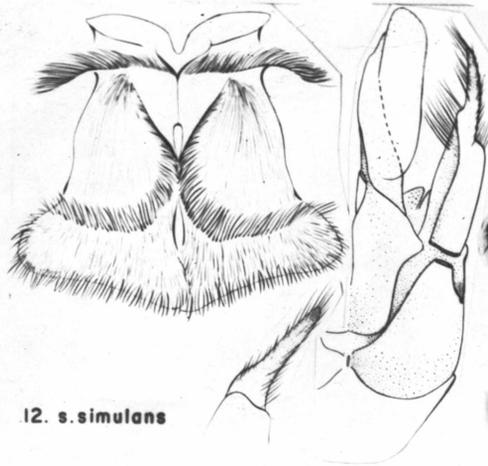
11. *p. meurus*



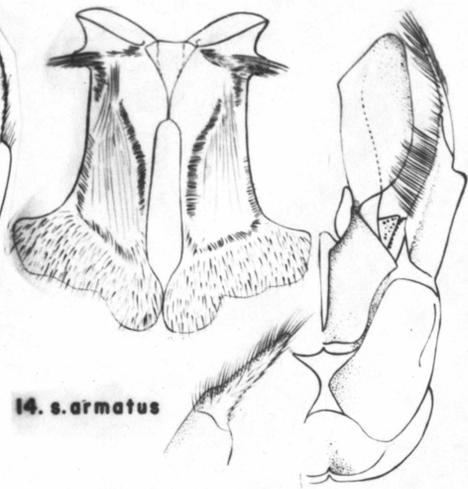
10. *latitarsis*



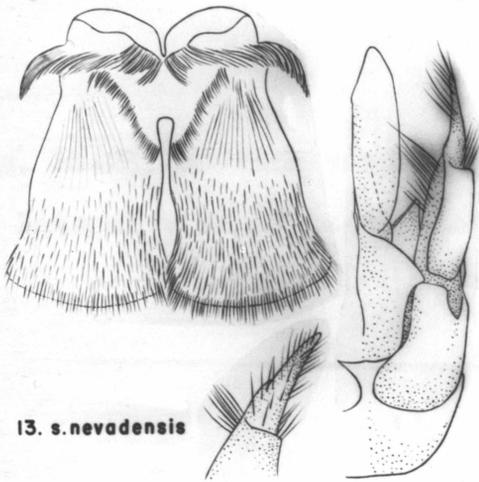
**Figs. 12-17. Seventh ventral plates, left half of capsule
and lateral view of gonostylus of male.**



12. *s. simulans*



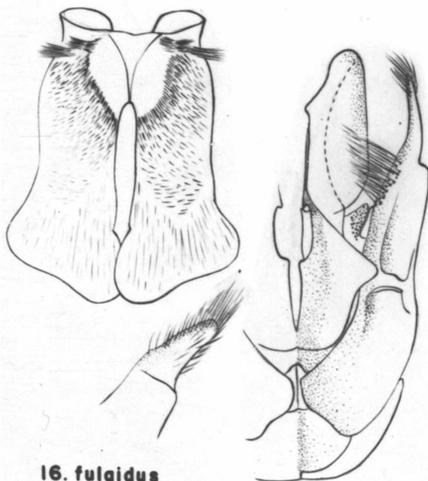
14. *s. armatus*



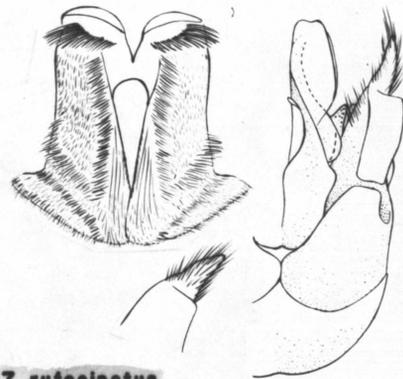
13. *s. nevadensis*



15. *s. angelicus*

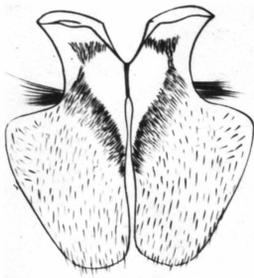


16. *s. fulgidus*

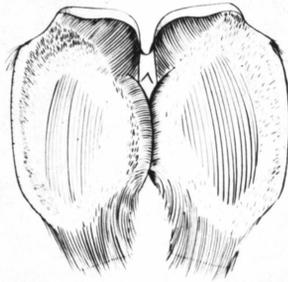


17. *s. rufocinctus*

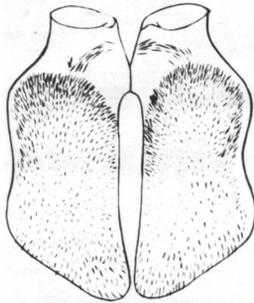
**Figs. 18-23. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



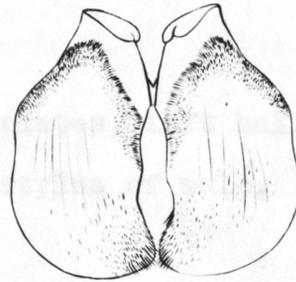
18. *lousae*



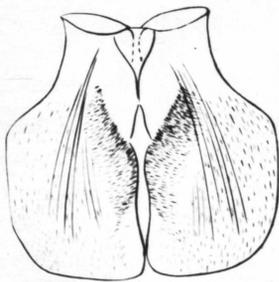
19. *bryanti*



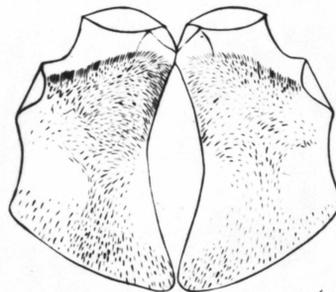
20. *birkmanni*



21. *sieveni*



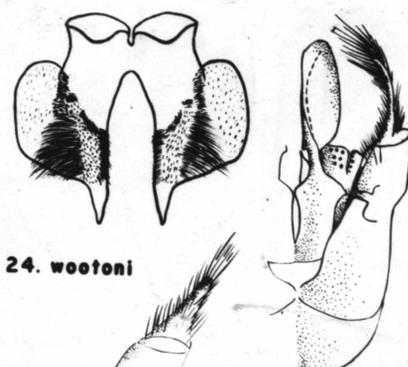
22. *eulophi*



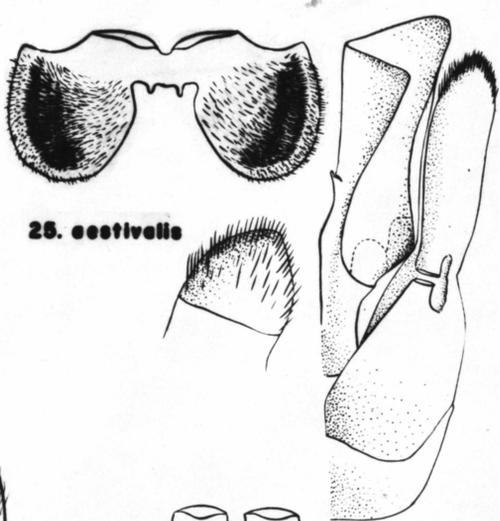
23. *kinecidii*



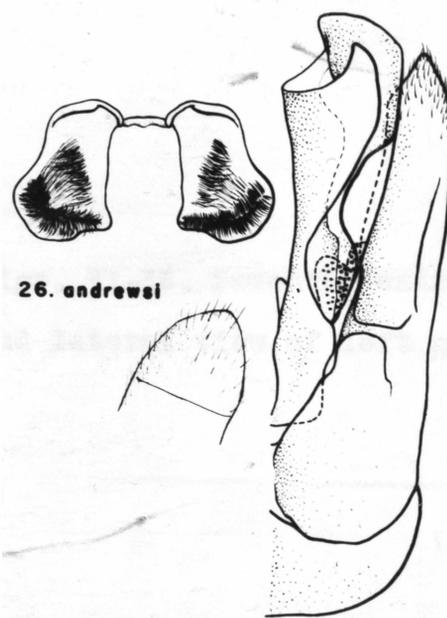
**Figs. 24-30. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



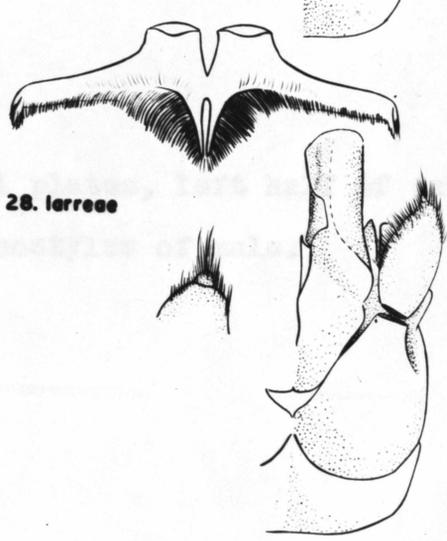
24. *wootoni*



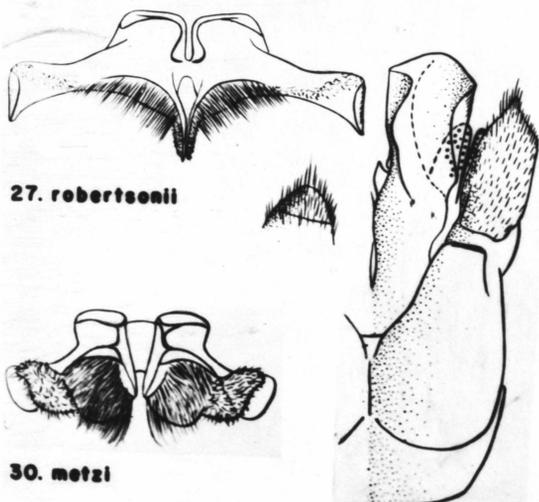
25. *aestivale*



26. *andrewsi*



28. *larreae*



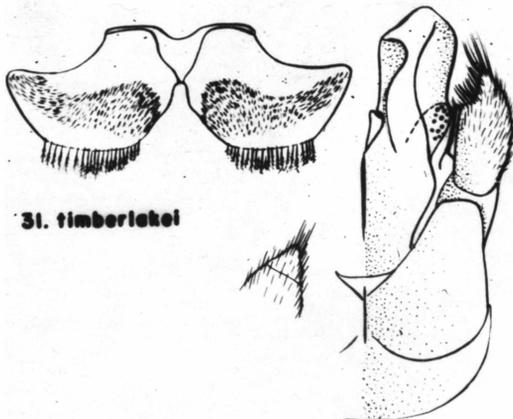
27. *robertsonii*

30. *metzi*

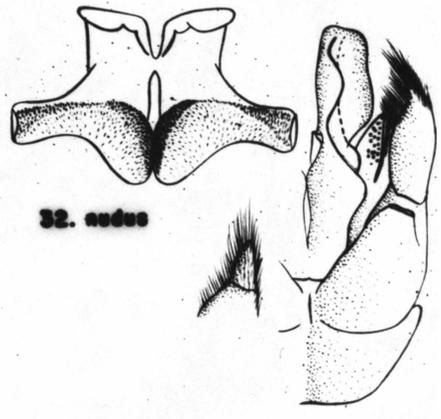


29. *kansensis*

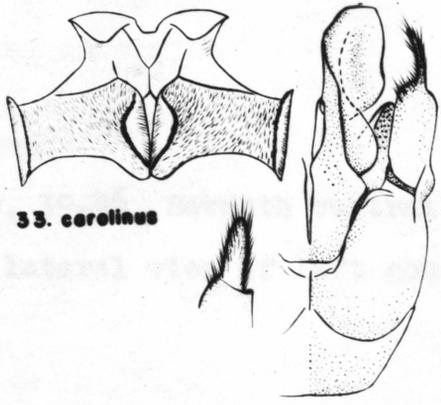
**Figs. 31-38. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



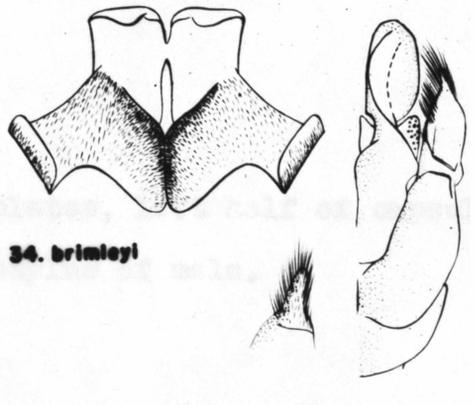
31. timberlakei



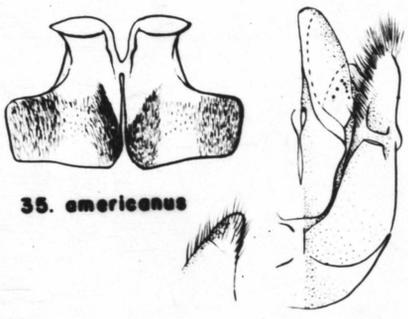
32. nodus



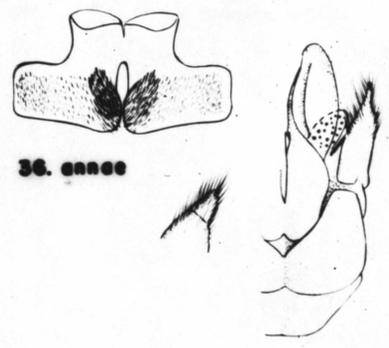
33. carolinus



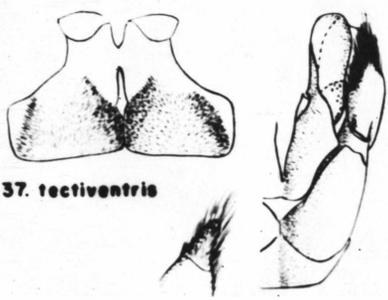
34. brimleyi



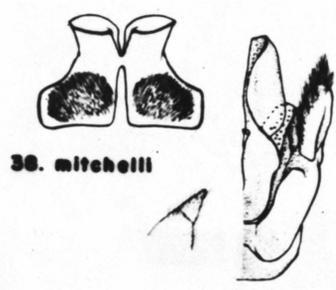
35. americanus



36. annae

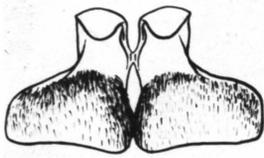


37. tectiventris



38. mitchelli

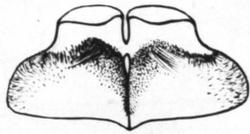
Figs. 39-46. Seventh ventral plates, left half of capsule and lateral view of left gonostylus of male.



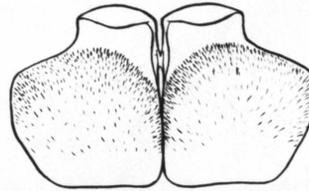
39. *ochraceus*



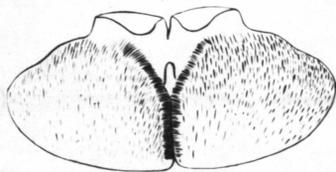
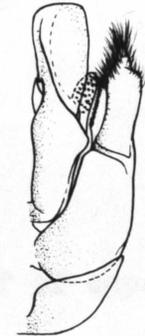
40. *gypsicola*



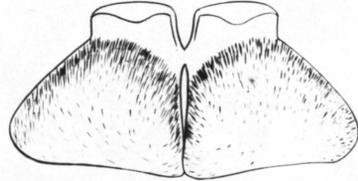
41. *albescens*



42. *aberrans*



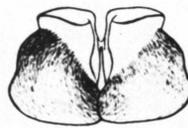
43. *saritensis*



44. *howardi*



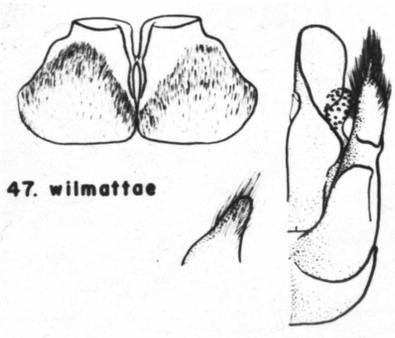
45. *susannae*



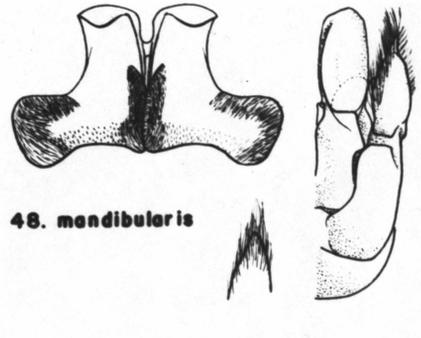
46. *thysanellae*



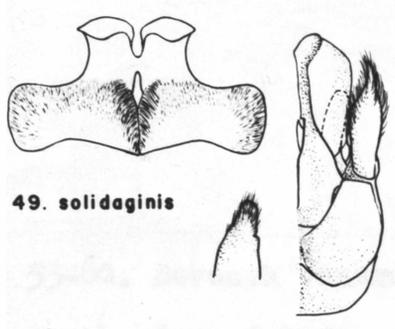
Figs. 47-54. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.



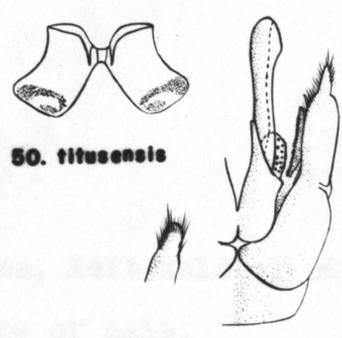
47. *wilmattae*



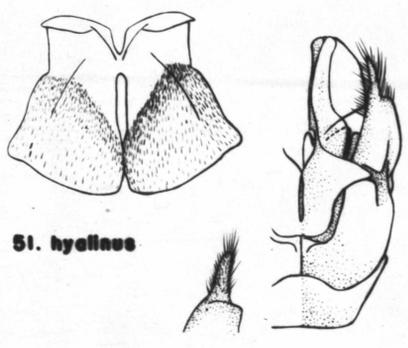
48. *mendibularis*



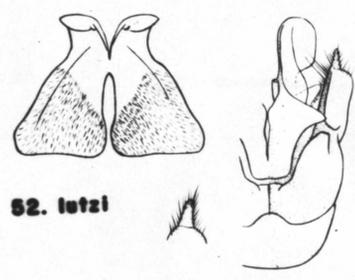
49. *solidaginis*



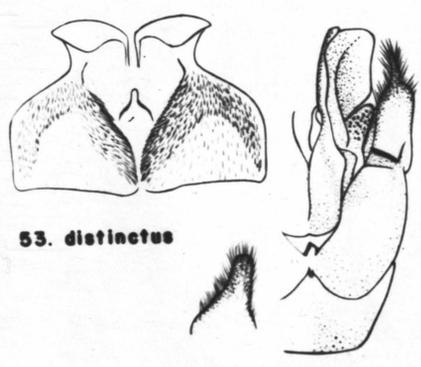
50. *tifusensis*



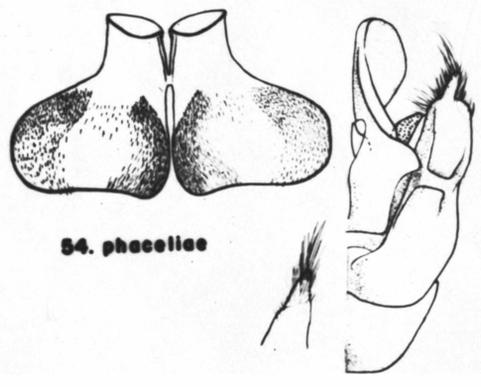
51. *hyalinus*



52. *letzi*

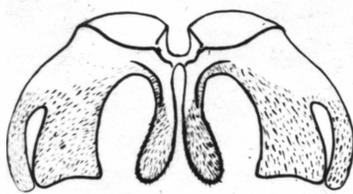


53. *distinctus*

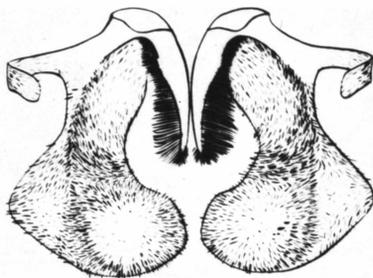


54. *phacelise*

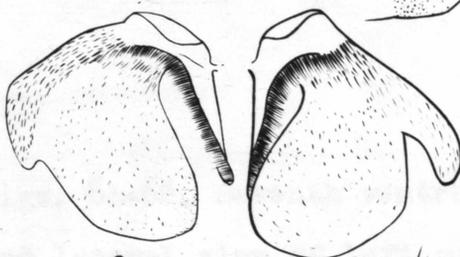
**Figs. 55-60. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



55. *inaequalis*



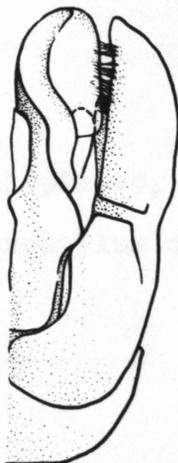
57. *validus*



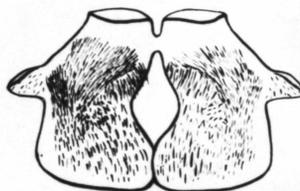
a.

56. *thoracicus*

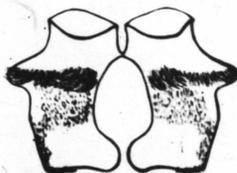
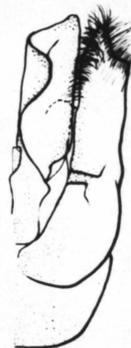
b.



58. *i. leucostri*



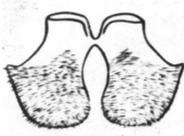
59. *willistoni*



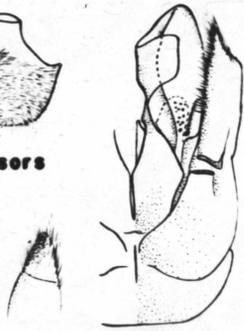
60. *brevicornis*



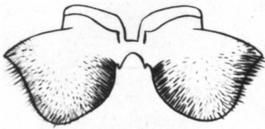
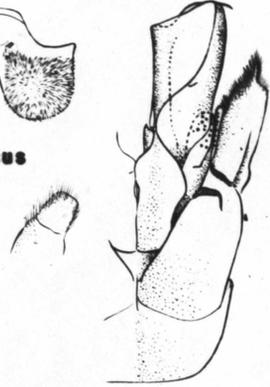
Figs. 61-68. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.



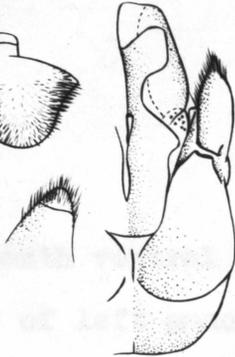
61. *consors*



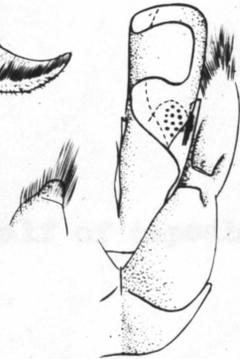
62. *paniscus*



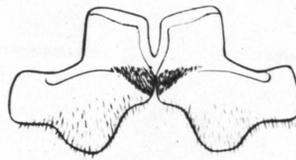
63. *nitescens*



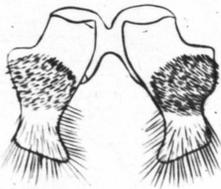
64. *californicus*



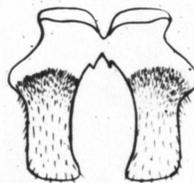
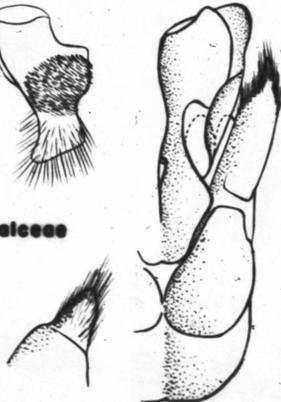
65. *nigrifrons*



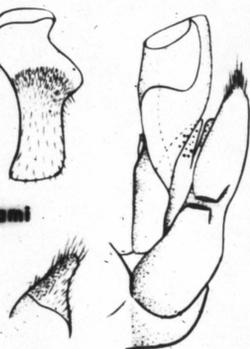
66. *swenki*



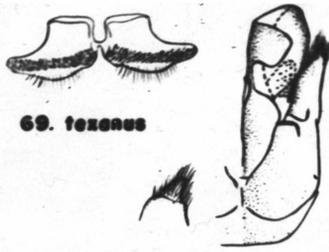
66. *sphaeralceus*



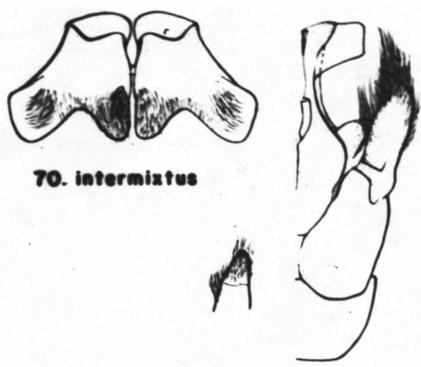
67. *wickhami*



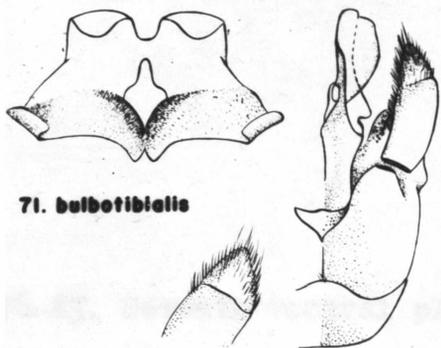
**Figs. 69-75. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



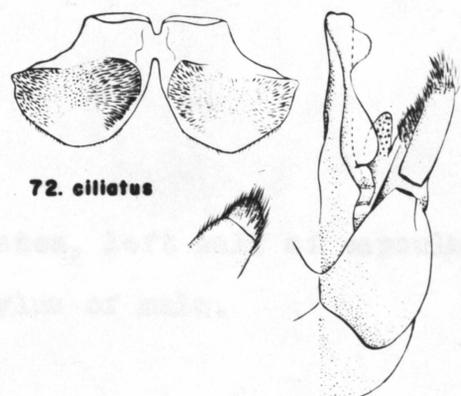
69. fezensis



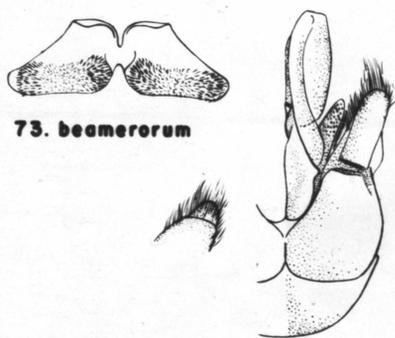
70. intermixtus



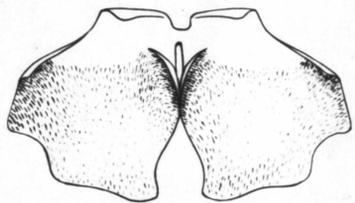
71. bulbotibialis



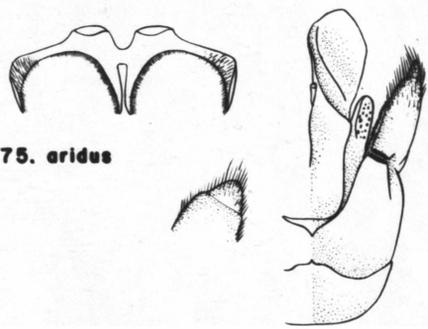
72. ciliatus



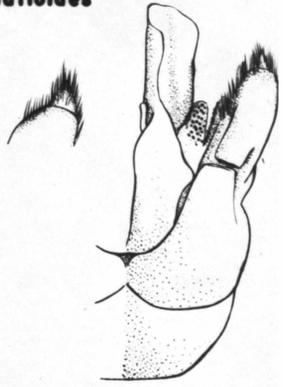
73. beamerorum



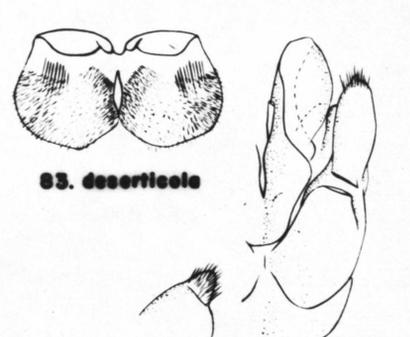
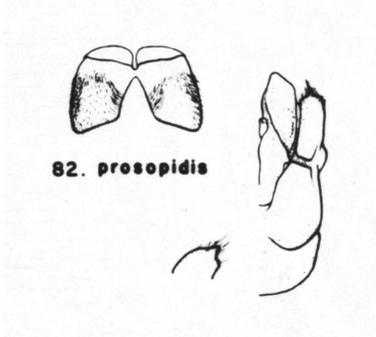
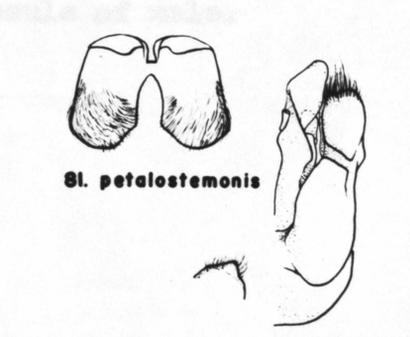
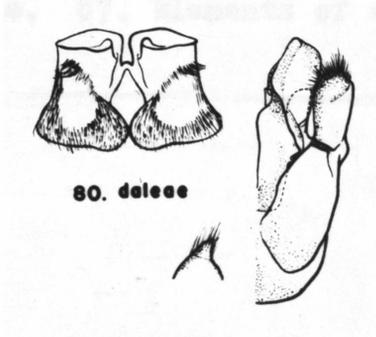
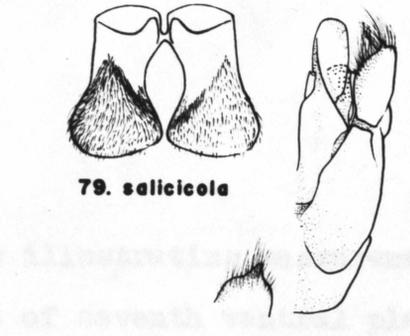
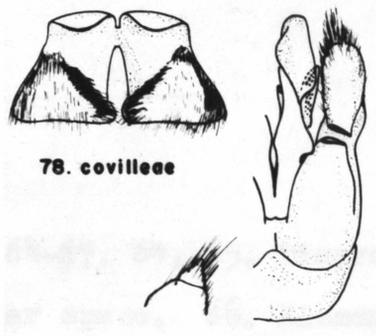
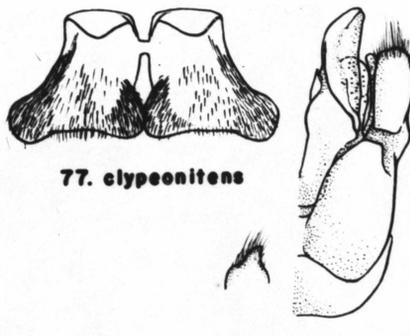
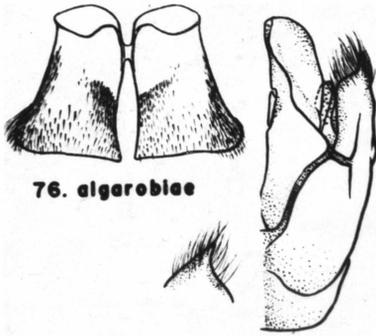
74. ciliatoides



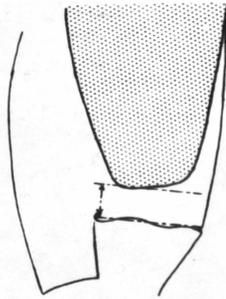
75. aridus



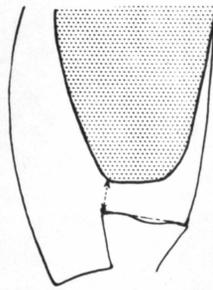
**Figs. 76-83. Seventh ventral plates, left half of capsule
and lateral view of left gonostylus of male.**



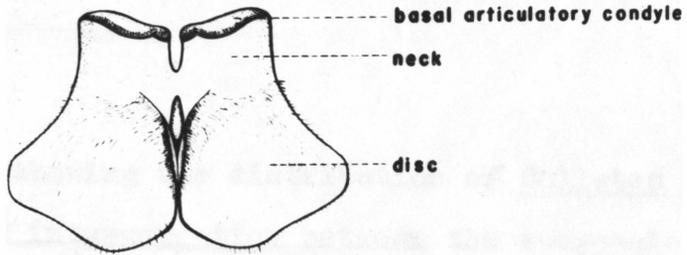
Figs. 84-87. 84, 85. Diagrams illustrating measurement of malar space. 86. Elements of seventh ventral plates of male. 87. Elements of capsule of male.



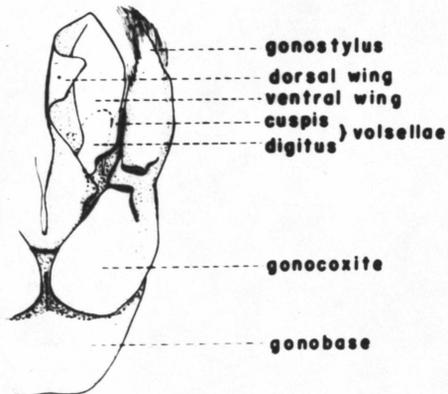
84.



85.

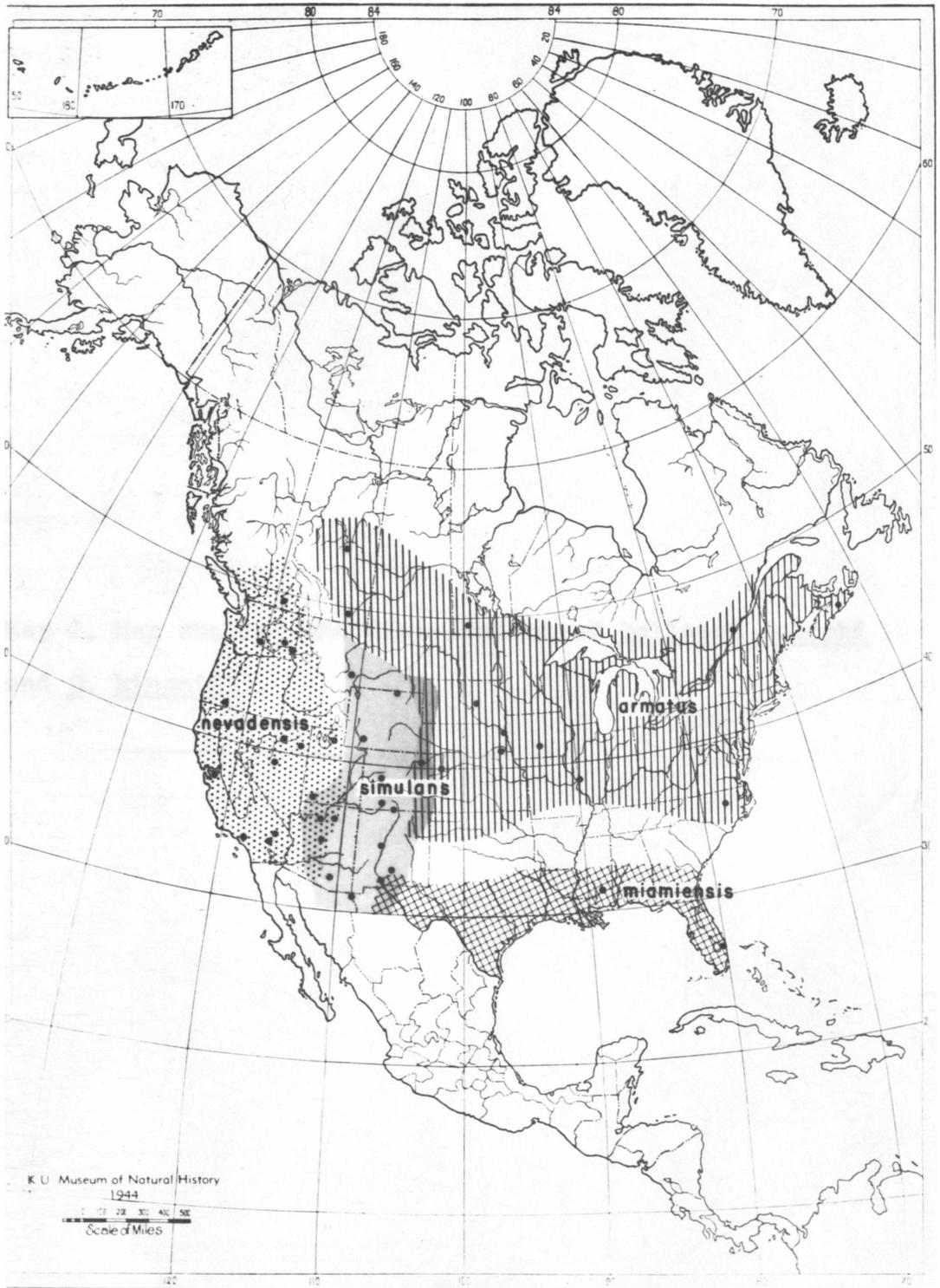


86. seventh ventral plates



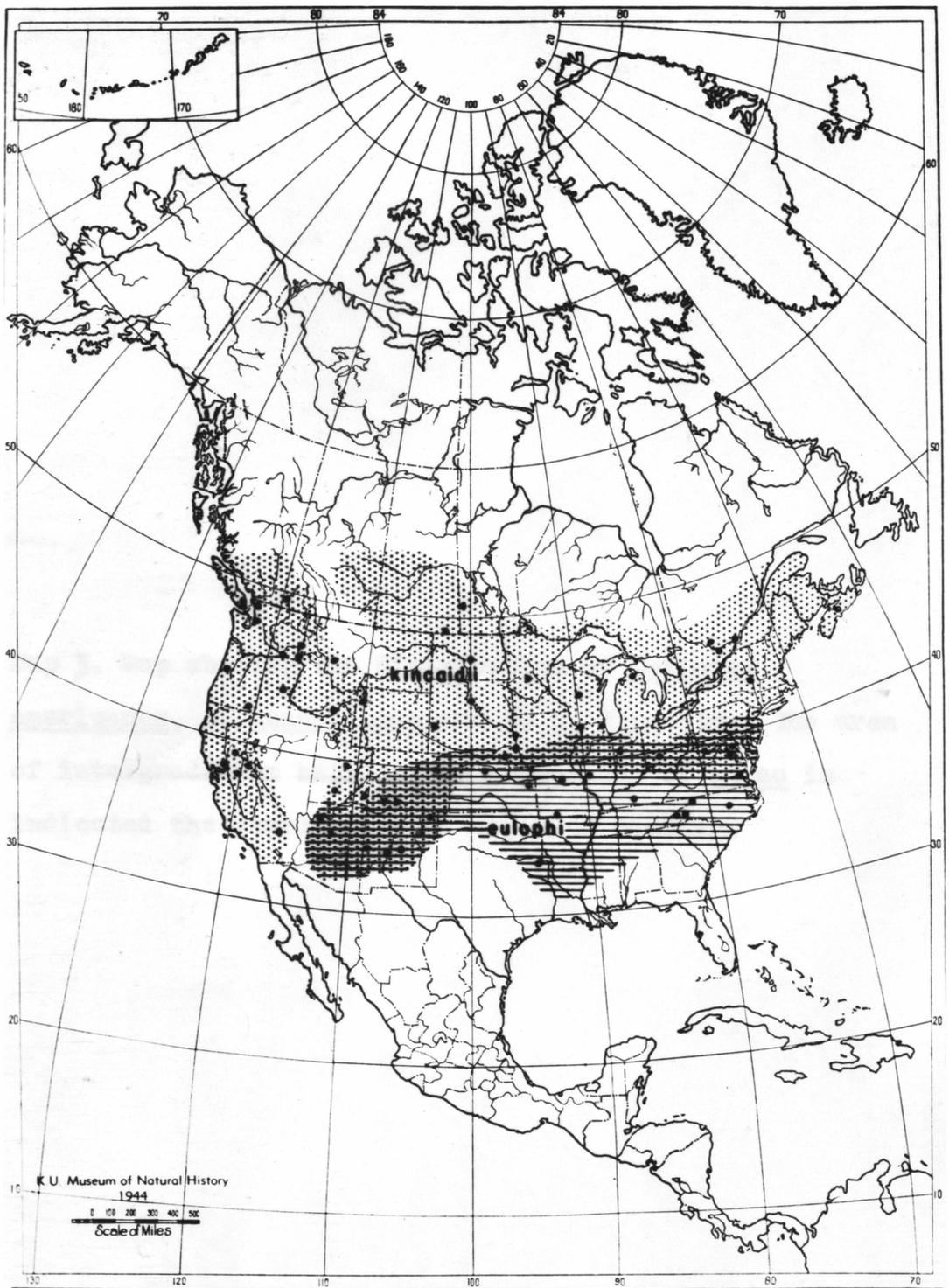
87. capsule

Map 1. Map showing the distribution of Colletes simulans.
The area of intergradation between the subspecies is
indicated by the overlapping of types of shading.



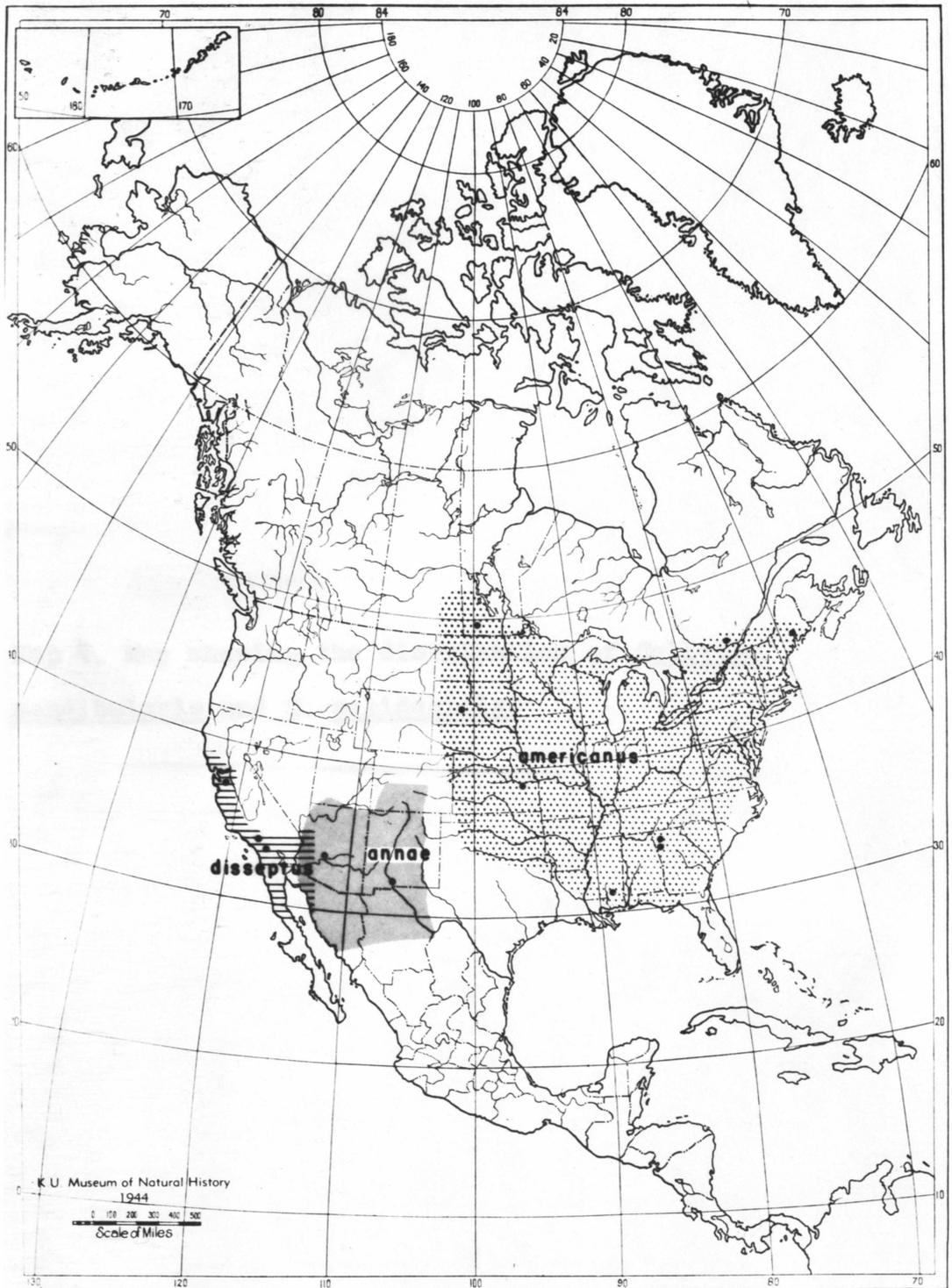
Map I.

Map 2. Map showing the distribution of Colletes eulophi
and C. kincaidii.



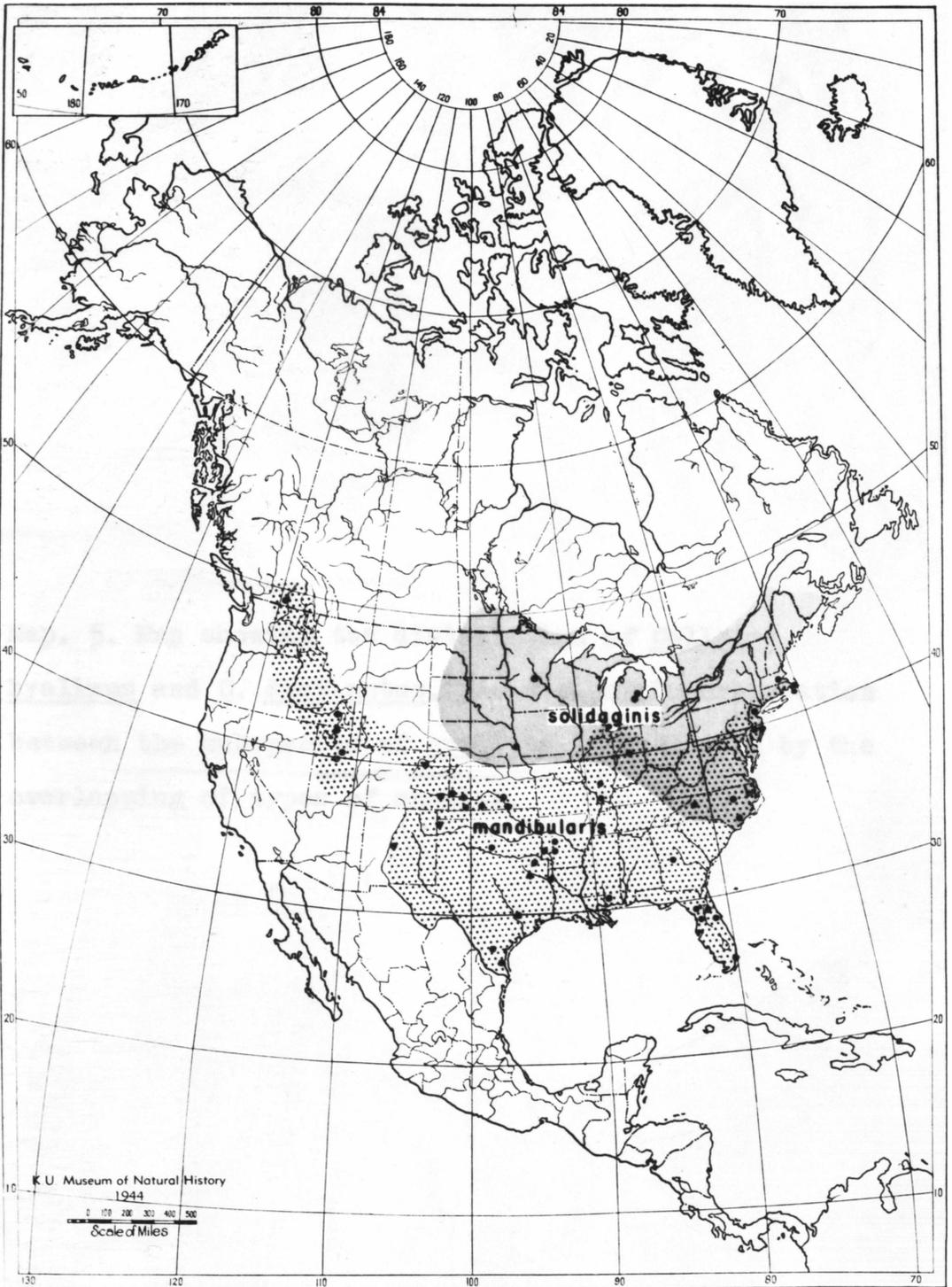
Map 2.

Map 3. Map showing the distribution of Colletes
americanus, C. annae annae and C. a. disseptus. The area
of intergradation between the subspecies of annae is
indicated the overlapping of types of shading.



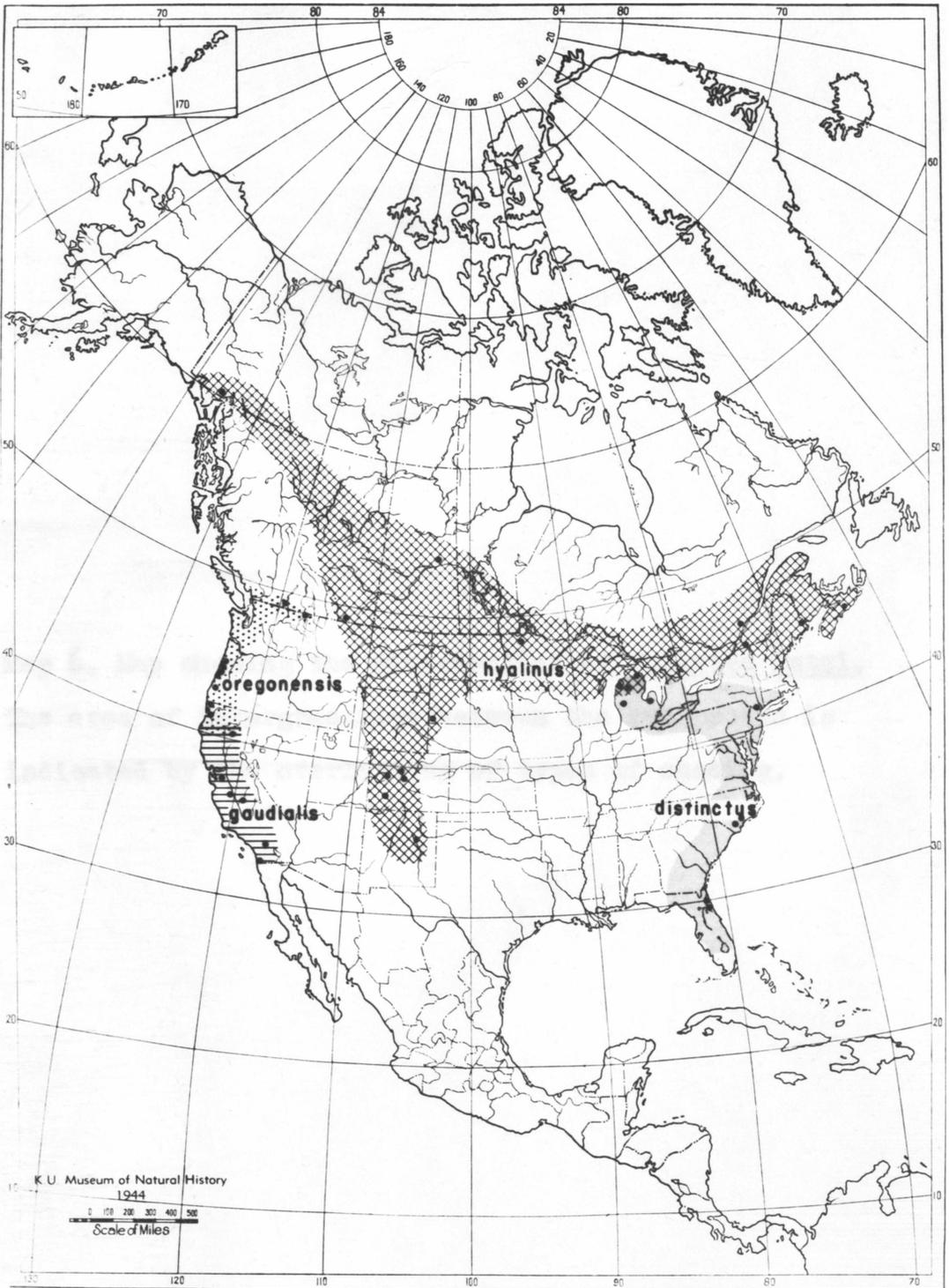
Map 3.

Map 4. Map showing the distribution of Colletes
mandibularis and C. solidaginis.



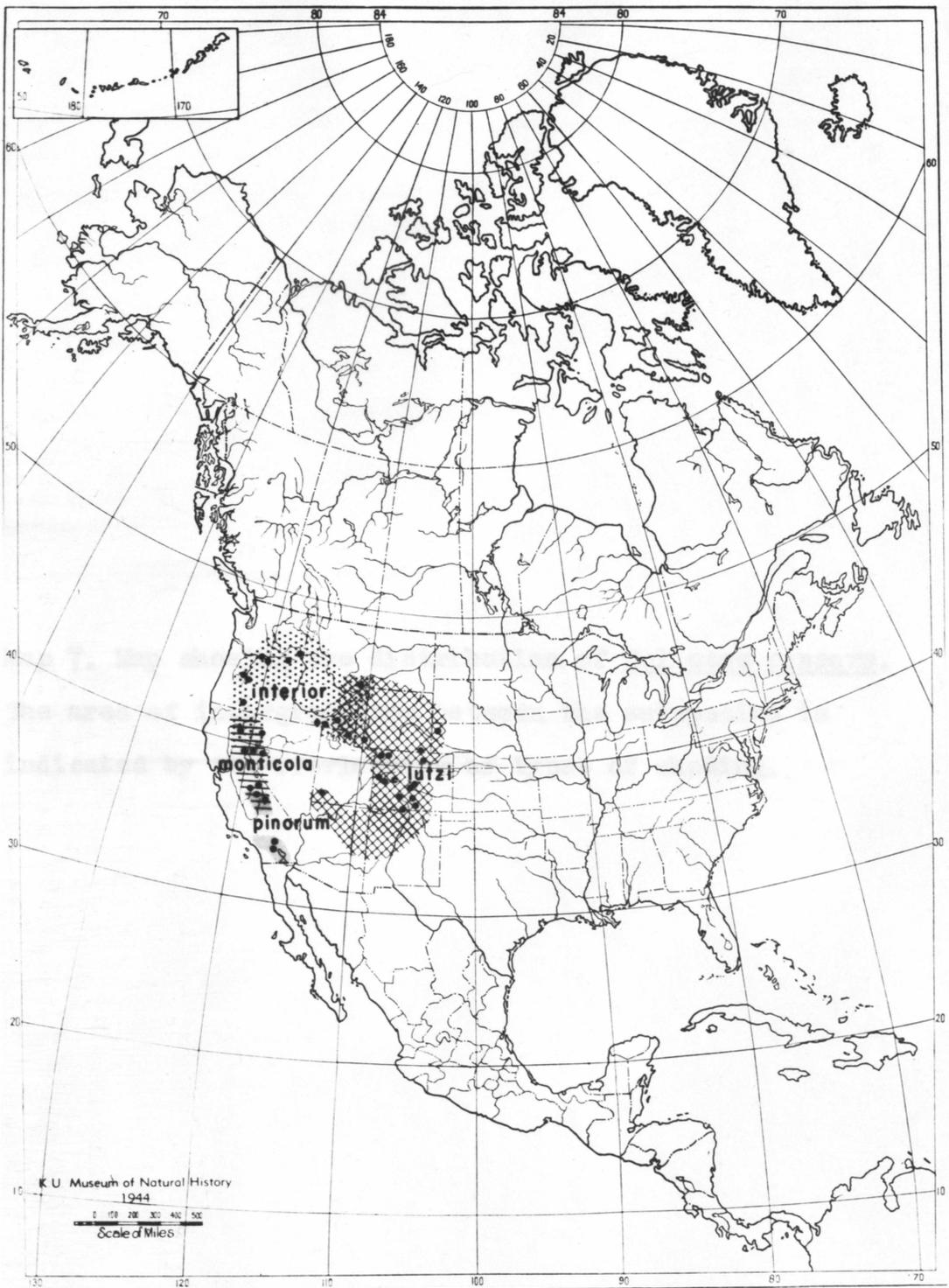
Map 4.

Map. 5. Map showing the distribution of Colletes
hyalinus and C. distinctus. The area of intergradation
between the subspecies of hyalinus is indicated by the
overlapping of types of shading.



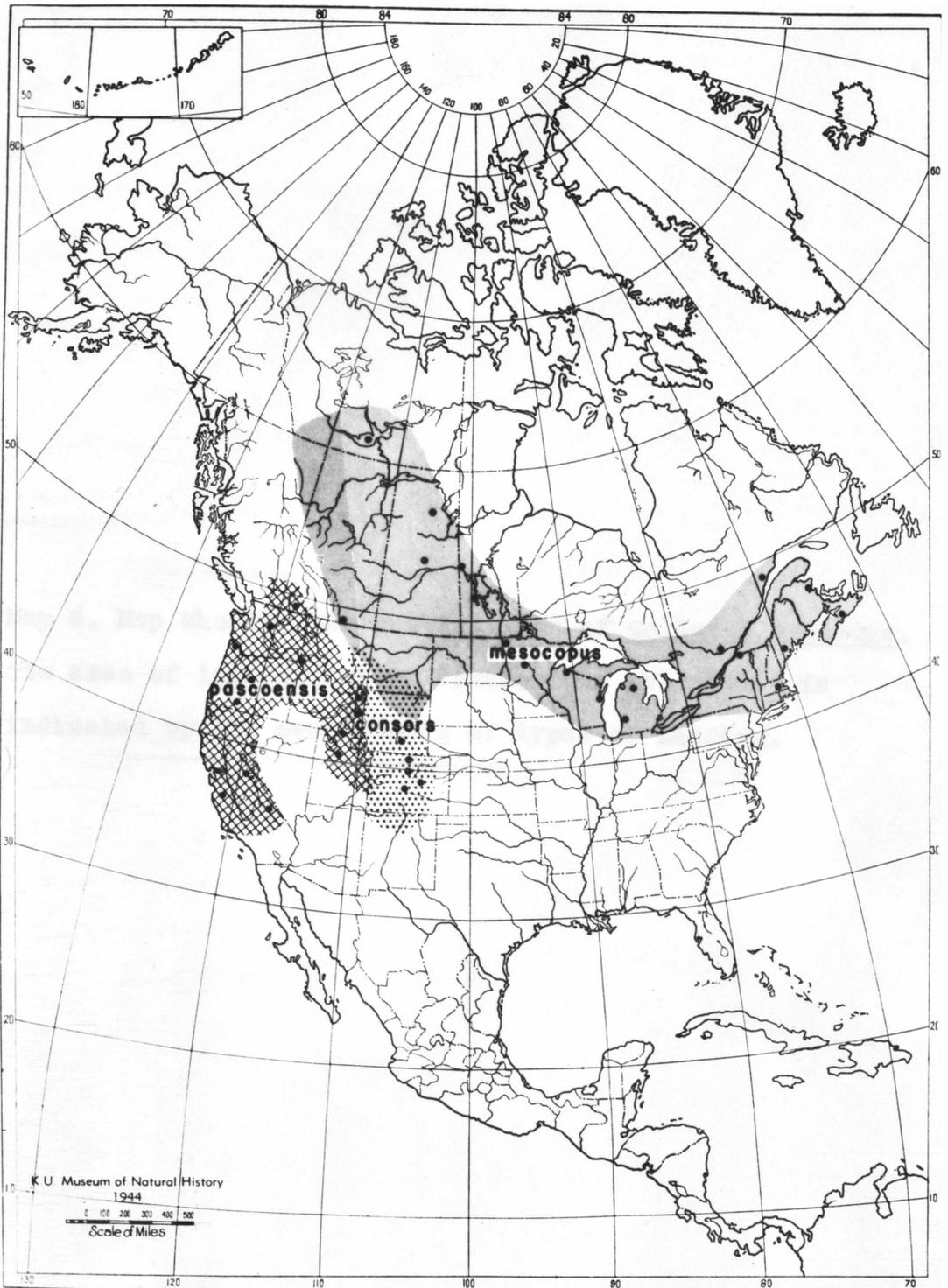
Map 5.

Map 6. Map showing the distribution of Colletes lutzi.
The area of intergradation between the subspecies is
indicated by the overlapping of types of shading.



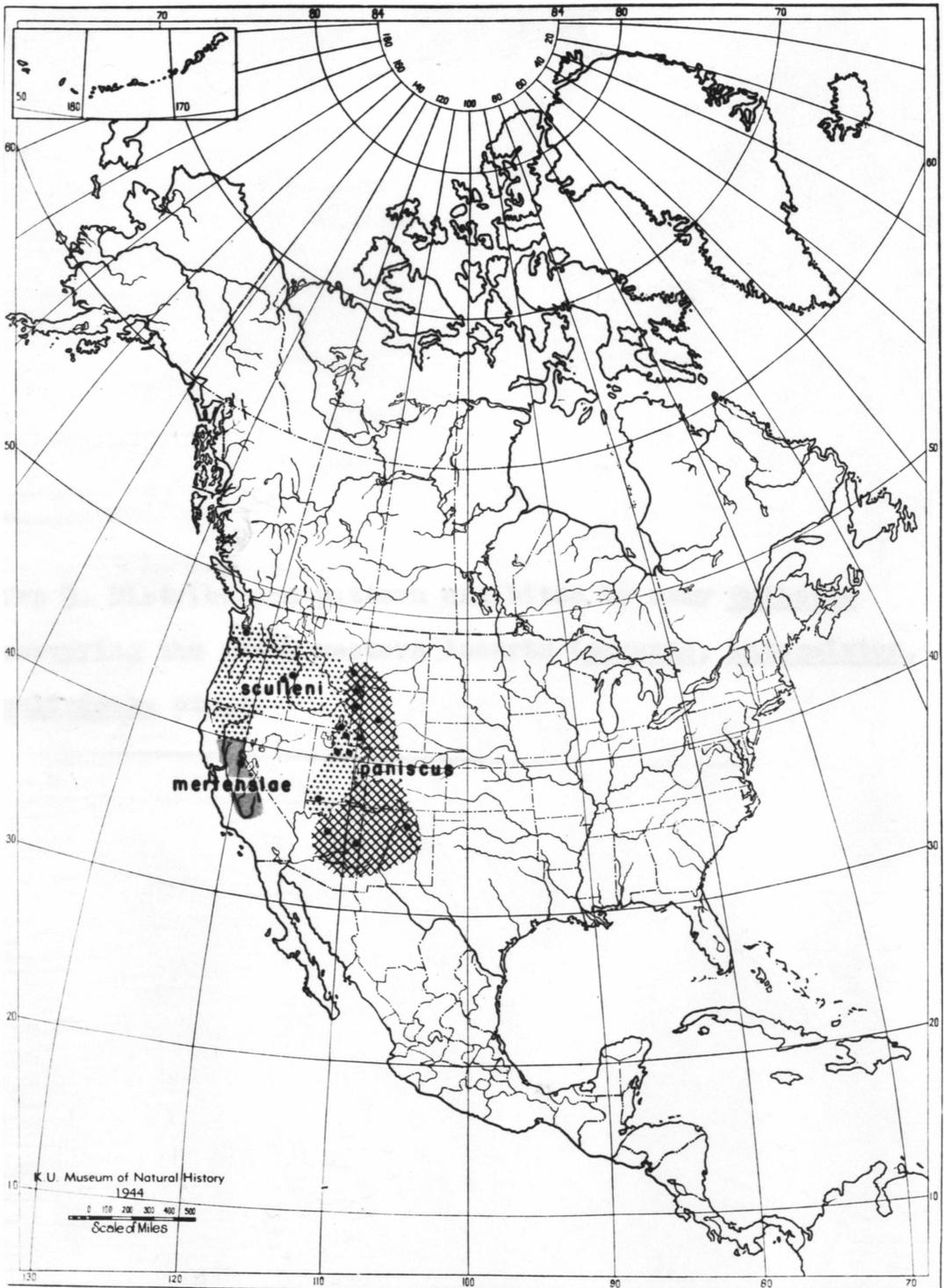
Map 6.

Map 7. Map showing the distribution of Colletes consors.
The area of intergradation between the subspecies is
indicated by the overlapping of types of shading.



Map 7.

Map 8. Map showing the distribution of Colletes paniscus.
The area of intergradation between the subspecies is
indicated by the overlapping of types of shading.



Map 8.

Map 9. Distribution pattern exhibited by many Colletes occupying the south-western deserts (texanus, intermixtus, salicicola etc.).



Map 9.