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THE NORTH AMERICAN SPECIES OF THE GENUS  
LIMNOPHORA ROBINEAU-DESVOIDY, WITH  
DESCRIPTIONS OF NEW SPECIES  
(MUSCIDÆ, DIPTERA)

(Continued from page 158)

BY H. C. HUCKETT

RIVERHEAD, N. Y.

*Limnophora (Spilogona) punctata* Schnabl and Dzierżicki, Abh. d. Kaiserl. Leop.-Carol. Deutsch. Akadem. d. Naturforsch., 1911 XCV Nr. 2 p. 154.—Collin, Ent. Month. Mag., 1921 ser. 3 VII pp. 97. 166.—Séguy, Faune de France, No. VI 1923 p. 212.—Karl, Tierwelt Deutschlands, 1928 Th. XIII p. 101.—Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 277, pls. 17. 24.

The species has been recorded by Coquillett (8) in his list of diptera occurring on the Commander Islands. I have not seen these specimens and hence am not able to verify the record. I have before me a male and female specimen of *punctata* from Sweden, sent by Mr. O. Ringdahl, which in my opinion differ from the following species recorded from Alaska, although the two species are closely allied.

In the European specimens the frons including the frontal vitta is lightly whitish pollinose, the proboscis is highly polished, the hypopleura has a single setula on upper margin cephalad of metathoracic spiracle, the mid tibia has no ventral bristle, and has two well developed anterodorsal bristles, the bristles on the

anteroventral surface of hind femur are well developed, even on proximal half, and the first abdominal sternum has numerous setulæ. In addition, the male abdomen is broadly ovate, with densely cinerous pruinescence on dorsum when viewed from behind, and with well defined blackish areas on ventral aspect of terga, which become brownish marks when viewed from in front. Terga 1 + 2 largely blackish, with grayish pollen along the caudal margin, tergum three with a pair of trapezoidal marks, tergum four with a pair of narrower, subtriangular marks, tergum five with a blackish to brownish fuscous area along dorsocentral plane, such markings confined to dorsum of abdomen. Processes of fifth abdominal sternum with a marked constriction at apex on inner margin, which is smooth and highly polished.

In the female the mesonotum has only a well marked dorso-central vitta, the scutellum is entirely grayish, terga 1 + 2 largely grayish pollinose with two small brownish spots, terga three and four with paired roundish marks on dorsum, tergum five at most with trace of dorsocentral marking, terga three, four, and five with large brownish areas on venter, anal plates of ovipositor with short fine spinules, fore tarsal segments slender, not broadened.

***Limnophora (Spilogona) alliterata* new species**

MALE, blackish; parafrontals and parafacials whitish pruinose, cheeks duller, with dark reflections; frontal vitta black, viewed from below with light brownish pollen; frontal triangle polished; antennæ and palpi black; proboscis with trace of pruinescence. Thorax blackish, subshining, with at most a trace of brownish pruinescence, with a presutural dorsocentral vitta when viewed from above and in front, otherwise the mesonotum and scutellum are entirely blackish. Abdomen densely brownish gray pruinose, with conspicuous brownish black, paired marks on terga 1 + 2, 3, and 4, with a lighter brownish dorsocentral mark on tergum 5. Legs black, pulvilli brownish tinged. Wings lightly infuscated, darker basad. Calyptræ yellowish tinged. Halteres deep yellow.

Eyes separated by a distance wider than breadth of third antennal segment; frontal vitta narrow, gradually broadening cephalad, distinctly separating the parafrontals caudad; parafrontal bristles in series to a level approximating the anterior ocellus, those on caudal half of series much weaker than those on cephalic half; parafacials, at base of antennæ, about equal in breadth to that of third antennal segment, considerably narrower ventrad; cheeks slightly higher than width of third antennal seg-

ment, with a series of weak upturned bristles along ventral margin, and with a number of short bristles and setulae adjoining the vibrissae.

Thorax with acrosticals setulose; with four pairs of postsutural dorso-central bristles; sternopleural bristles arranged 1: 1.

Abdomen broadly ovate, with conspicuous paired marks, which become successively smaller and more widely separated caudad, those on terga 1 + 2 large and expansive, narrowly separated at middle, those on terga three and four slightly arcuate in outline, tergum five with a lighter dorso-central mark; basal sclerite of hypopygium pollinose; first sternum with setulae.

Fore tibia with a fine median posteroventral bristle: mid femur with a complete series of fine longish anteroventral setulae which become stouter basad, with a series of fine bristles on proximal two-thirds of posteroventral surface; mid tibia with or without a short anterodorsal bristle, with 1 or 2 posterior bristles, and with or without a median posteroventral bristle: hind femur with a complete series of anteroventral bristles, those on proximal half shorter and finer than those on distal half, with a series of fine bristles on proximal half of posteroventral surface; hind tibia with 2 or 3 anteroventral, and 2 or 3 anterodorsal bristles, with or without 1 or 2 weaker posterodorsal bristles. Pulvilli robust.

Wings with veins *R.* 4 + 5 and *M.* 1 + 2 divergent toward wing margin; *m-cu* cross vein sinuate, oblique; costal thorns very small.

FEMALE, similar to male, thorax and abdomen more densely grayish pollinose, with intensive seal brown markings. Parafrontals brownish infuscated along border of frontal vitta; proboscis lightly pollinose. Thorax with five brownish vittae, the median three more pronounced, with a more or less narrow transverse infuscated area immediately caudad of transverse suture; scutellum with large brownish areas at basal angles. Abdominal markings concolorous with those of thorax. Wings clear, veins dark brown.

Head from in front much broader than high; frontal vitta wider at narrowest than length of third antennal segment; parafrontals setulose; proboscis stoutly developed. Abdomen with three pairs of expansive marks on terga 1 + 2, 3, and 4 respectively, each pair distinctly separated at middle, those on terga three and four arcuate in outline; with or without indications of a dorsocentral vitta on terga three and four. Ovipositor with fine spinules on anal plates.

Fore tibia with 1 or 2 posterior bristles, irregularly placed: mid femur with a series of short bristles on proximal half of posteroventral surface; mid tibia with or without a short anterodorsal bristle, with 2 posterodorsal bristles, and with or without a posteroventral bristle: hind femur with fine bristles on proximal half of posteroventral surface; hind tibia with 2 or 3 anteroventral, and 2 or 3 anterodorsal bristles, with 1 or 2 setulose bristles on posterodorsal surface. Fore tarsus with conspicuous fine sensory hairs at apex of each segment on antero- and posteroventral surfaces; pulvilli short.

Length, 5.5-7 mm.

## RECORDS:—

1 ♂, 3 ♀, Naknek Lake, Savonoski, Alaska, July 1919; 1 ♂, 3 ♀, August 1, 1919; 1 ♂, August 1919. (J. S. Hine) 2 ♀, Banff, Alta. July 4, 1925. (Owen Bryant) 1 ♂, 2 ♀, Tennessee Pass, Colo., 10240 ft. July 11.—(J. M. Aldrich)

Type and allotype in collection of Professor J. S. Hine, Columbus, Ohio. Paratypes in collection of the United States National Museum.

The species very closely resembles *compuncta*, especially in the male sex, and there is a probability that this was the species recorded by Coquillet (8) as *compuncta*. However, in comparison with European specimens of the latter species there are certain significant differences present in the female of *alliterata* which, in my opinion, justify the separation of the species on taxonomic grounds.

In the female of *alliterata* the thorax is intensively marked by three to five vittæ, the scutellum has broad patches at basal angles of scutellum, the markings on the abdomen are arcuate in outline, and the bristles on proximal half of anteroventral surface are weakly developed, setulose, whereas in *compuncta* the thorax has only a median vitta, the scutellum is entirely grayish pollinose, the abdominal marks are roundish and restricted in area, and the bristles on anteroventral surface of hind femur are stoutly developed, even to base.

The males of *alliterata* may be distinguished from those of *compuncta* by the lack of well developed bristles on anterodorsal surface of mid tibia, by the lack of a marked apical process or attenuation on inner margin of processes of fifth abdominal sternum which is highly polished, and by the weaker development of those bristles on proximal half of anteroventral series of hind femur.

There is a third species related to the above two, namely *novæ-angliæ*, which in the female may be readily distinguished by the presence of a stout mid ventral bristle on mid tibia, and in the male by the lack of a median posterior bristle on fore tibia, and by having the first sternum of abdomen bare.

The male of the specimens collected in Colorado differs essentially from those taken in Alaska in having the parafrontals contiguous, thereby reducing the distance between the eyes.

***Limnophora (Spilogona) trilineata* new species**

MALE, blackish; parafrontals and parafacials densely silvery pruinose; cheeks with duller pruinescence, with reddish to blackish reflections; frontal vitta black with trace of brownish pruinescence; frontal triangle and proboscis polished; antennæ and palpi black. Thorax subshining, with three broad bandlike vittæ on mesonotum, with paler pruinose streaks along the planes of dorsocentral bristles and on lateral declivities of mesonotum; scutellum subshining, blackish, with a more or less obscure paler pruinose area on discal surface. Abdomen densely pale grayish pruinose with dark reflections; terga 1+2, three, four, and five with paired blackish marks, tergum five with brownish infuscation; basal sclerite of hypopygium lightly grayish pruinose. Legs blackish, pulvilli brownish tinged. Wings smoky, more densely infuscated basad; calyptre tinged with yellowish brown; halteres deep yellow.

Eyes with numerous hairs, separated by a distance equal to that between posterior ocelli; parafrontals contiguous caudad; frontal vitta considerably broadened cephalad; parafrontal bristles continued in series caudad to about level with apex of frontal triangle; parafacials at base of antennæ broader and cheeks higher than width of third antennal segment, the former but little constricted ventrad, the cheeks well maintained caudad.

Thorax densely setulose, acrosticals setulose, postsutural dorsocentral bristles four pairs, sternopleural bristles arranged 1:1, mesopleural series of bristles with one or two intermediate predorsal bristles.

Abdomen conical, terga 1+2 largely blackish, faintly divided at middle; terga three and four with marks sharply defined, those on tergum three trapezoidal, on tergum four subtriangular, the latter smaller and more widely separated than those on tergum three; tergum five with a pair of small subtriangular marks restricted caudad.

Fore tibia with no median posterior bristle: mid femur with a few weak short bristles on proximal third of anteroventral surface, with 5 strong straight bristles on proximal half and a series of fine longish setulæ on distal half of posteroventral surface; mid tibia with 3 posterior bristles: hind femur with 3 or 4 bristles on distal half of anteroventral surface, posteroventral surface with no series of bristles; hind tibia with 2 anteroventral, and 2 anterodorsal bristles, and with or without 1 or 2 weaker bristles on posterior surface. Wings with veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin.

FEMALE, paler than male; head with dense grayish brown pruinescence; parafrontals with brownish infuscation; frontal vitta black; frontal triangle brownish pruinose. Thorax densely pollinose, with three narrow brownish vittæ between the dorsocentral bristles, and broader vittæ laterad; scutellum with brownish areas at basal angles; macrochætæ set in brownish spots. Abdomen grayish pollinose; terga 1+2 largely grayish pollinose; with trace of brownish marks on terga three and four; tergum five with a brownish dorsocentral vitta. Wings faintly tinged, slightly infuscated basad; veins brownish. Calyptre yellowish.

Eyes with a few inconspicuous hairs; chaetotaxy of thorax similar to that of male. Abdomen with traces of brownish marks on terga 1+2, terga three and four with widely separated subtriangular marks; ovipositor with spinules on anal plates.

Fore tibia with no posterior bristle: mid femur with 4 bristles on proximal half of posteroventral surface; mid tibia with 2 posterior bristles: hind legs missing.

Length, 6 mm.

#### RECORDS:—

1 ♀, Carcross, Yukon Territory, July 21, 1919. (H. G. Dyar)

1 ♂, Anchorage, Alaska, June 6, 1921. (J. M. Aldrich)

Type and allotype in the United States National Museum.

The species is to be readily distinguished from other North American forms of this genus by the hairy eyes and by the peculiar form of the vittæ on mesonotum. In the males the eyes are particularly hairy, and the thorax has three broad, ribband-like vittæ lying within and without the planes of the dorsocentral bristles when viewed from in front: in the female the dorso-central marking is subdivided into three narrow distinctive vittæ, all of which lie between the series of dorsocentral bristles.

The species most closely resembles the European species *depressiuscula* Zett. specimens of which have been kindly sent to me for comparison by Mr. Ringdahl after he had examined the American specimens.

#### *Limnophora (Spilogona) imitatrix* (Malloch)

*Melanochelia imitatrix* Malloch, Canad. Ent., 1921 LIII p. 64.—

Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4 p. 204.

Male blackish; parafrontals and parafacials silvery pruinulent; cheeks not so densely pruinulent, with dark reflections; antennæ and palpi black; proboscis polished. Thorax blackish, subshining, with trace of grayish brown pruinescence; abdomen densely grayish brown (cinereous) pruinulent; terga 1+2 largely blackish; terga three, four, and five with paired blackish marks, those on tergum five more or less fused and less distinctively colored than those on previous segments; hypopygium and fifth sternum blackish, lightly pollinose, subshining. Legs blackish, pulvilli tinged. Wings lightly infuscated, more deeply so basad and on membrane adjoining the proximal half of costa:

calyptræ whitish; halteres yellowish brown, with trace of purplish.

Head with eyes relatively large, separated by a distance slightly greater than diameter of anterior ocellus; parafrontals, parafacials, and cheeks restricted: parafrontal bristles strongly developed, continued in series caudad to about level with apex of frontal triangle; parafrontals contiguous, thereby restricting the frontal vitta; parafacials at base of antennæ narrower than breadth of third antennal segment, but little narrowed ventrad; cheeks about as high as length of third antennal segment, with a series of prominent upcurved setulæ along the ventral margin; antennæ short.

Thorax with presutural acrosticals setulose, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:1; mesopleural series of bristles with one or two weak intermediate predorsal bristles.

Abdomen with markings on each successive segment decidedly smaller than the ones preceding, restricted to dorsum of terga; terga three and four with marks trapezoidal, on the former segment the marks are broader than long and are narrowly separated, on the latter segment the marks are longer than broad and are more distinctly separated; tergum five with narrow subtriangular areas, closely adjacent; processes of fifth sternum with dense setulæ.

Fore tibia with no posterior bristle: mid femur with a series of 2 or more erect bristles on proximal half of posteroventral surface, most of which are very stoutly developed; mid tibia with 2 or 3 posterior bristles: hind femur with 5 bristles on distal half of anteroventral surface, proximal half of posteroventral surface bare; hind tibia with 2 anteroventral, and 3 anterodorsal bristles, and with 2 weaker posterior bristles.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent toward wing margin; *m-cu* cross vein erect, but slightly sinuate.

Female paler in color than male; head grayish pruinose; parafrontals with brownish infuscation along border of frontal vitta; proboscis highly polished. Thorax densely grayish pruinose, with a distinct brownish dorsocentral vitta, and with brownish sublateral areas not so well defined; scutellum with

brownish marks at basal angles, otherwise densely grayish pruinose. Abdomen grayish pruinose, subshining, with paired, brownish marks on terga 1 + 2, three, and four; tergum five with a brownish dorsocentral vitta. Wings clear, veins yellowish brown; halteres yellow.

Parafrontals with a few setulæ, parafacials at base of antennæ as wide and cheeks fully as high as breadth of third antennal segment. Abdominal marks widely separated, those on terga three and four subtriangular: ovipositor with fine setulæ on anal plates. Mid femur with 2 or 3 posteroventral bristles: hind femur with 3 to 5 bristles on distal half of anteroventral surface, otherwise bristling of legs similar to that of male.

Length, 5 mm.

RECORDS:—

- 1 ♂, Bering Island, July–August 1922. (L. Stejneger) 1 ♂, Banff, Alta., June 29, 1925; 2 ♀, July 5, 1925. (Owen Bryant) 1 ♂, Hopedale, Labrador, July 7, 1923; 1 ♀, July 8, 1923.

This species was included by Malloch in his key to the North American forms of *Spilogona* (= *Melanochelia* Malloch *nec* Rondani) without further description. The type which had evidently been designated and is to be found in the collection of the Illinois Natural History Survey, is from Nain, Labrador. All the specimens of this species that I have examined, including the type, have four pairs of postsutural dorsocentral bristles, and not three pairs as indicated in Malloch's key.

The species resembles *bisetosa* (p. 300) in that the mid femur of male possesses a series of very stoutly developed, erect, bristles on posteroventral surface, the wings are densely infuscated basad, and the hind femur has no bristles on proximal half of posteroventral surface. However in *imitatrix* the thorax has four pairs of postsutural dorsocentral bristles, the mesopleural series of bristles has 1 or 2 weakly developed intermediate predorsal bristles, and the processes of fifth abdominal sternum have a dense series of short setulæ at base adjoining the inner border, whereas in *bisetosa* the thorax has three pairs of postsutural dorsocentral bristles, the mesopleural series of bristles has no accessory predorsal bristles, and the processes of fifth



abdominal sternum have no dense series of setulæ at base. In the female these differences also hold true except for the fifth abdominal sternum.

The male specimen from Berling Island differs from those from Labrador or Alberta in having the abdominal marks on tergum three fused across the dorsocentral plane, and on tergum four the marks are triangular in shape, the inner margins of which are divergent cephalad.

***Limnophora (Spilogona) brevicornis* (Malloch)**

*Tetramerinx brevicornis* Malloch, Canad. Ent., 1917 XLIX p. 226.—Malloch, Ent. News, 1918 XXIX p. 32.—Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4, p. 209.

*Limnophora brevicornis* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 148.

*Melanochelia brevicornis* Malloch, Canad. Ent., 1921 LIII pp. 62. 63.

RECORDS:—

Alberta, 2 ♂, 3 ♀, Lake Newel, June 9, 1923. (Walter Carter)

Montana, 1 ♂, Yellowstone Lake, Aug. 9, 1918. (A. L. Melander)

Wyoming, 1 ♀, U. Geyser Basin, Yellowstone Park, Aug. 7, 1918. (A. L. Melander)

Colorado, 1 ♂, no locality nor date label.

New York, 1 ♀, Essex Co., Lot 46.

Quebec, 1 ♂, Roberval, July 28, 1913. (G. Beaulieu); 1 ♀, Ciaticook, Sept. 10, 1913. (J. I. Beaulne)

Maine, 1 ♀, Machias, July 17 —.

The species was described from Illinois, females having been captured on the shores of Lake Michigan. The type and allotype are in the collections of the Illinois Natural History Survey, Urbana.

In color of pruinescence the species resembles *cretans*, but that species has bristles on proximal half of posteroventral surface of hind femur, and the hind tibia has only one strong bristle on anterodorsal surface of hind tibia. The male of *brevicornis* may be readily recognized by the peculiar marking on the mesonotum, and the female by the large densely grayish pruinose

frontal triangle of head, and by the presence of stout spinelike hooks on the suranal plate of ovipositor. The mesonotum of the male, when viewed from above and in front, is grayish white pruinulent with a more or less obscure brownish dorsocentral vitta on the presutural area, and a rectangular, spotlike brownish mark between the first and third pairs of postsutural dorsocentral bristles.

***Limnophora (Spilogona) incauta* new species**

**MALE**, brownish gray; parafrontals and parafacials whitish pruinulent; cheeks duller, with dark reflections; frontal vitta blackish, viewed from below with brownish pruinulence; frontal triangle pollinose; antennæ and palpi blackish; proboscis polished. Thorax grayish, subshining, mesonotum with prominent brownish dorsocentral and narrow sublateral vittæ; lateral marks more or less obscure; scutellum largely grayish with brownish marks at basal angles. Abdomen lightly grayish brown pruinulent, subshining, with a narrow brownish interrupted dorsocentral vitta; terga 1+2 largely grayish when viewed from behind; terga three and four with paired brownish black marks; tergum five infuscated on caudal half; macrochætæ set in brownish spots; basal sclerite of hypopygium blackish, subshining. Legs blackish, pulvilli brownish. Wings tinged faintly, but little, if any, darker basad; cross veins clear. Calyptæ yellowish; halteres yellow.

Eyes separated by a distance about equal to twice that between posterior ocelli; frontal vitta distinctly separating parafrontals throughout their entire length; parafrontal bristles strongly developed, continued in series caudad to a level approaching that of anterior ocellus; parafacials at base of antennæ about as wide as width of third antennal segment; cheeks higher than greatest width of parafacials.

Thorax with acrosticals setulose, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1: 1.

Abdomen cylindrico-conical; markings on terga three and four subtriangular, widely separated and restricted to dorsum; sternum five with numerous fine longish setulæ.

Fore tibia with 2 posterior bristles; mid femur with a series of fine short anteroventral bristles, and with a series of 6 posteroventral bristles on proximal half; mid tibia with 1 or 2 anterodorsal, and 2 posterior bristles; hind femur with 4 anteroventral bristles on distal half, and a series of fine setulæ on proximal half of anteroventral surface, posteroventral surface with the setulæ on median third stronger developed than those on proximal or distal third; hind tibia with 1 or 2 anteroventral, and 2 or 3 anterodorsal bristles, and with 2 or 3 weaker posterior bristles.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin; *m-cu* cross vein slightly sinuate.

FEMALE, paler in color than male, parafrontals, parafacials, and cheeks brownish gray pruinose; parafrontals with brownish infuscation along border of frontal vitta. Thorax more densely grayish pollinose than in male, otherwise similar; abdominal marks variable, abdomen with or without a dorsocentral vitta; terga 1+2 uniformly grayish pruinose, terga 3 and 4 with paired brownish marks. Wings yellowish tinged, especially basad; veins yellowish brown.

Parafrontals with a few setulæ, parafacials and cheeks in profile wider than breadth of third antennal segment; buccal area of cheeks with few, if any, setulæ along ventral margin; sternopleural bristles arranged 1:2.

Abdominal marks indefinite in outline and size, widely separated; ovipositor with fine setulæ on anal plates.

Fore tibia with 1 or 2 posterior bristles: mid femur with a series of bristles on proximal half of posteroventral surface; mid tibia with 1 or 2 anterodorsal, and 2 or 3 posterior bristles: hind femur with 4 or 5 bristles on distal half of anteroventral surface, and with or without 1 to 3 longish setulæ on posteroventral surface; hind tibia with 1 or 2 anteroventral, and 2 or 3 anterodorsal bristles, and with 2 or 3 weaker posterior bristles.

Length, 6.5 mm.

#### RECORDS:—

1 ♀, Naknek Lake, Savonoski, Alaska, June 1919; 1 ♂, 1 ♀, July 1919; 1 ♀, July 27, 1919. (J. S. Hine)

Type and allotype in the collection of Professor J. S. Hine, Columbus, O.

Two of the above females have three pairs of postsutural dorsocentral bristles; the allotype has a series of three and four such bristles; the male has four pairs of postsutural dorsocentral bristles and this number I have assumed to be the normal number.

In the females there is also a considerable degree of variation in the development of the setulæ on posteroventral surface of hind femur, whilst in the single male specimen the setulæ are much stronger developed on median third than on proximal or distal third of posteroventral surface. The male specimen has two setulæ on the first abdominal sternum.

The species most closely resembles *rufitarsis*, from which it differs in the male through the shape of the abdomen and in the color of fore tarsi and calyptræ: in the female of *rufitarsis* the parafacials are relatively narrow, being constricted ventrad, whereas the cheeks are relatively broad, being higher than breadth of parafacials at base of antennæ: in *incauta* the para-

facials and cheeks are moderately broad, the former being scarcely narrower ventrad than at base of antennæ.

***Limnophora (Spilogona) fuscomarginata* new species**

MALE, blackish; parafrontals and parafacials silvery pruinose; cheeks whitish pruinose with dark reflections; frontal vitta black with whitish pruinescence; frontal triangle and proboscis polished; antennæ and palpi black. Thorax largely blackish, subshining, with trace of brownish pruinescence on mesonotum, vittæ obscure; humeral and notopleural callosities grayish. Abdomen with grayish pruinescence on cephalolateral angles of terga three, four, and five; terga 1+2 largely blackish, terga three and four with large expansive black marks, tergum 5 with narrow marks which are more or less obscured by infuscation on caudal half; basal sclerite of hypopygium blackish, subshining; processes of fifth sternum with the inner border reddish brown in color. Legs black; pulvilli brownish tinged. Wings smoky, more intensively infuscated basad: calyptræ tinged; halteres yellow.

Eyes separated by a distance about equal to breadth of third antennal segment; frontal vitta narrow, linear caudad, separating the parafrontals throughout; parafrontal bristles strongly developed, series extending caudad to almost level with anterior ocellus; parafacials linear in profile, at base of antennæ narrower than breadth of third antennal segment; cheeks about as high as width of third antennal segment, with a series of upturned setulæ along ventral margin.

Thorax with two closely adjacent series of presutural acrostical bristles, the latter fine and setulose, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:1.

Abdomen narrowly conical, terga 1+2 with marks obscurely separated at middle, terga three and four with marks subtriangular, more or less distinctly divided at middle, tergum five with narrow obscure triangular marks; processes of fifth sternum clothed with fine setulæ and a few weak bristles along inner border.

Fore tibia with no posterior bristle; mid femur with a series of short weak anteroventral bristles which become appressed on distal third, with a series of longish bristles on proximal two-thirds of posteroventral surface; mid tibia with 1 anterodorsal and 2 posterior bristles; hind femur with 3 or 4 bristles on distal third of anteroventral surface, and a series of short weak setulose bristles on proximal two-thirds of anteroventral and posteroventral surfaces, the bristles not readily distinguished; hind tibia with 2 anteroventral, and 2 or 3 anterodorsal bristles, and with 2 weaker posterior bristles. Wings with veins *R.* 4+5 and *M.* 1+2 subparallel; *m-cu* cross vein erect, or slightly sinuate.

FEMALE, paler than male; parafrontals, parafacials, and cheeks grayish pruinose, the former with trace of brownish infuscation along border of frontal vitta; frontal vitta black with grayish frontal triangle; thorax

and abdomen grayish, subshining; mesonotum with three brownish vittæ; scutellum with brownish marks at basal angles; abdomen with brownish paired marks on terga 1+2, three, and four; tergum five with brownish dorsocentral vitta and infuscation on caudal half. Wings slightly tinged, *r-m* and *m-cu* cross veins clouded; veins brownish; calyptæ yellowish tinged.

Parafrontals with a few setulæ: ovipositor with fine setulæ on anal plates.

Fore tibia with no posterior bristle: mid femur with 2 or 3 fine bristles on proximal one third of posteroventral surface; mid tibia with 1 anterodorsal, and 2 posterior bristles: hind femur with 4 or 5 bristles on distal half of anteroventral surface; hind tibia with 2 or 3 anteroventral, and 2 or 3 anterodorsal bristles, and with 2 weaker posterior bristles.

Length, 5 to 5.5 mm.

#### RECORDS:—

British Columbia, 1 ♂, Hedley, July 7, 1923. (C. B. D. Garrett)

Alberta, 1 ♀, Banff, July 16, 1922. (C. B. D. Garrett); 1 ♂, Banff, June 24, 1925; 1 ♂, July 17, 1925. (Owen Bryant)

Wyoming, 1 ♂, Yellowstone Park, July 25, 1907. (W. Robinson)

Quebec, 1 ♀, Seven Islands, July 20, 1924. (F. W. Waugh)

The species most closely resembles *crassiventris* (p. 292) in that the thorax has four pairs of postsutural dorsocentral bristles, the hind femur has no distinctive bristles on proximal half of posteroventral surface, and the parafacials and cheeks are relatively narrow. The males differ essentially in that in *fuscomarginata* the processes of fifth sternum of abdomen are not conspicuously attenuated at apex, and the inner borders are more or less reddish brown; the abdomen has relatively expansive subtriangular marks, narrowly separated at middle; and the parafrontals have a uniformly developed series of bristles; whereas in *crassiventris* the fifth abdominal sternum is entirely blackish with the apex of each process distinctly attenuated; the abdomen is largely whitish pruinose with small widely separated dorsal marks, and the cephalic pairs of parafrontal bristles are noticeably stouter developed than those caudad.

In the female of *fuscomarginata* the scutellum has blackish spots at basal angles, the wings have the cross veins conspicuously clouded, and the mid tibia has 1 or 2 anterodorsal bristles,

whereas in *crassiventris* the scutellum is entirely grayish pollinose, the wings have cross veins clear, and the mid tibia has no anterodorsal bristles.

Type and allotype in the Canadian National Collection.

### *Limnophora (Spilogona) torreyæ* Johannsen

*Limnophora torreyæ* Johannsen, Trans. Amer. Ent. Soc., 1916 XLII No. 756 p. 391.—Johannsen, Ent. News, 1917 XXVIII p. 326.

*Limnophora umbrina* Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 48. 54.

*Melanochelia torreyæ* Malloch, Canad. Ent., 1921 LIII p. 61.

*Spilogona torreyæ* Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII, 1925 p. 229.—Huckett, Mem. 101 N. Y. (Cornell) Agric. Exp. Station, 1928 (1926), p. 834.

#### RECORDS:—

9 ♂, 20 ♀, Buttermilk, Ithaca, N. Y., July 18, 1920; 2 ♀, Old Forge, N. Y., Aug. 2, 1905; 2 ♀, Aug. 6, 1905; 1 ♀, July 16, 1905; 1 ♀, July 21, 1905; 1 ♀, Albany, N. Y., June 24, 1920.  
(M. D. Leonard) 1 ♂, Hempstead, L. I., N. Y., Aug. 21, 1921.

This is a striking species with frons and mesonotum covered with deep seal brown coloration; the pleura, in contrast, are pale gray pruinose. The legs are very sparsely and weakly bristled. In the male, the head is flattish on top with the facets of the eyes considerably coarser than those below, the parafrontals and cheeks are reduced to lineal dimensions. In the female the proboscis is densely pollinose.

So far, this species is only known to occur in the northern States of eastern America.

### *Limnophora (Spilogona) crassiventris* new species

MALE, head blackish; parafrontals and parafacials silvery pruinose with dark reflections; cheeks not so densely pruinose; frontal vitta black with whitish pollen; frontal triangle and proboscis polished; antennæ and palpi black. Thorax blackish, shining; mesonotum blackened, with trace of dorsocentral vitta on presutural area and on postsutural area immediately cephalad of scutellum; notopleural callosity paler; scutellum entirely black. Abdomen densely whitish pruinose, the ventral surface infuscated: terga 1+2 entirely blackish, terga three and four with paired black marks; tergum five with an indefinite dorsocentral fuscous area; basal

sclerite of hypopygium blackened, subshining. Legs black, subshining; tarsi brownish. Wings smoky; calyptre whitish, more or less tinged with brownish infuscation; halteres deep yellow.

Eyes separated by a distance not greater than that between posterior ocelli exclusive; frontal vitta small, restricted; parafrontals contiguous; parafrontal bristles stoutly developed, continued in series caudad to apex of frontal triangle; parafacials at base of antennæ narrower than breadth of third antennal segment, restricted ventrad; cheeks scarcely as wide as breadth of third antennal segment, viture along the ventral margin coarsely developed; antennæ small, third segment barely longer than second, arista with short though distinct pubescence towards base.

Thorax with acrosticals setulose, with four pairs of postsutural dorso-central bristles; sternopleural bristles arranged I: 2.

Abdomen conical, noticeably deep dorsoventrad and broadened at base; markings on terga three and four restricted, well defined, and broadly separated, those on tergum three subquadrangular, those on tergum four smaller, and subtriangular; tergum five with a more or less median fuscous area, the paired spots at most very much reduced and confined to caudal margin; cercal plates reddish (upper forceps of genitalia); fifth sternum deeply notched caudad, with numerous coarse setulæ, the processes sharply attenuated at apex into a more or less digitlike extenuation.

Fore tibia with or without a median posterior bristle: mid femur with a series of bristles on posteroventral surface, those on the distal half much weaker and shorter than those on the proximal half; mid tibia with no anterodorsal bristle, and with two posterior bristles: hind femur with 4 or 5 anteroventral bristles on distal half, posteroventral surface with no bristles on proximal half; hind tibia with 2 anteroventral, and 2 anterodorsal bristles, and with 2 weaker posterior bristles.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin.

FEMALE, paler in color than male; head, thorax, and abdomen densely grayish pruinulent; frontal vitta brownish pruinulent; thorax with three narrow brownish vittæ; scutellum entirely grayish: abdomen with two paired brownish marks on terga three and four respectively, and a brownish dorso-central vitta on tergum five; terga 1+2 almost entirely grayish pruinulent. Wings clear; veins yellowish brown, becoming more yellowish basad; calyptre whitish.

Parafacials, at base of antennæ, nearly equal in breadth and cheeks in height to width of third antennal segment; the latter one and a half times length of second segment. Abdomen with well defined, restricted, subtriangular spots on terga three and four; terga four and five with a median transverse series of well developed bristles; anal plates of ovipositor with setulose hairs.

Fore tibia with 1 median posterior bristle: mid femur with 4 or 5 bristles on proximal half of posteroventral surface; mid tibia with no anterodorsal bristle, and with 2 posterior bristles: hind femur with 3 bristles on distal

half of anteroventral surface, posteroventral surface with no series of bristles on proximal half; hind tibia with one anteroventral, and 1 or 2 anterodorsal bristles, and with 1 or 2 weaker posterior bristles.

Length, 5 mm.

RECORDS:—

Alaska, 2 ♂, Naknek Lake, Savonoski, July 1919; 1 ♂, 1 ♀, July 27, 1919; 1 ♀, Aug. 1919; 1 ♀, Aug. 1, 1919; 1 ♀, Aug. 14, 1919; 1 ♂, July 28, 1919; 1 ♀, July 31, 1919. (J. S. Hine) 1 ♂, Popoff Island, July 13, 1899; 1 ♂, (?) Muir Inlet, June 12, 1899. (Harriman Exped. '99, T. Kincaid)

Washington, 1 ♂, Olympia, no date.

Ontario, 1 ♂, Lake Abitibi, Low Bush, July 23, 1925; 1 ♂, July 30, 1925; 1 ♀, Aug. 2, 1925. (N. K. Bigelow)

Type and allotype in the collection of Professor J. S. Hine, Columbus, Ohio. Paratypes in the collection of the United States National Museum.

This species runs to *zetterstedti* in Ringdahl's key (39), but according to Mr. Ringdahl it is not that species. In certain respects the species resembles *contractifrons*, especially in the characteristic appearance of the male abdomen, but from this species it may be distinguished by the fact that the normal number of postsutural dorsocentral bristles is four pairs and not three, and that the hind femur has no series of posternoventral bristles on proximal half, such as is present in *contractifrons*.

*Limnophora (Spilogona) acuticornis* Malloch

*Limnophora acuticornis* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 147.—Friscon, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4 p. 203.

*Melanocheilia acuticornis* Malloch, Canad. Ent., 1921 LIII p. 64.

*Spilogona acuticornis* Malloch, Psyche, 1924 XXXI No. 5 p. 202.—Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII, 1925 p. 229.—Huckett, Mem. 101 N. Y. (Cornell) Agric. Exp. Station, 1928 (1926) p. 834.

RECORDS:—

Washington, 2 ♂, Olympia, June 22 1920; 1 ♂, Yakima, July 18 1920. (A. L. Melander 1 ♂, Ilwaco, July 7 1918. (A. Spuler)



Idaho, 2 ♀, 1 ♀, viola, no date.; 1 ♀, Craig's Mts., no date.;  
1 ♀, Lawyer's Canyon, June 16 1909; 1 ♀, Moscow, June 18  
1912. (J. M. Aldrich)

California, 2 ♀, Mount Home Canyon, St. Bernardino Mountains, 1924. (J. M. Aldrich)

Utah, 1 ♂, Emigrant Canyon, Wasatch Mts., 7000 ft. July 8  
1911. (J. M. Aldrich)

Nevada, 1 ♀, Wells, June 20 1927. (J. M. Aldrich)

Colorado, 3 ♀, Tennessee Pass, July 24 1917. (J. M. Aldrich)

New York, 1 ♀, Ithaca, May 5 1916; 1 ♀, no date.; 1 ♀, May  
23 1920; 1 ♀, May 22 1922; 2 ♀, Buttermilk, Ithaca, July 18  
1920.

Quebec, 1 ♂, Hull, Aug. 13 1924; 1 ♂, June 26 1923. (C. H.  
Curran)

Nova Scotia, 1 ♀, Truro, July 5 1913. (R. Matheson)

As mentioned by Malloch (31) there is a great similarity between this species and *surda* Zett. In addition to the characters proposed by him for distinguishing the species I find that the males of the above series of specimens differ from those of *surda* in that the cephalic pair of ocellar bristles are more robust, the eyes are more widely separated, and the bristles on the proximal third of posteroventral surface of mid femur, if present, are much weaker than those in *surda*. In the female the fore tibia has no median posterior bristle, and the *m-cu* cross vein is cloudy.

### ***Limnophora (Spilogona) surda* (Zetterstedt)**

*Aricia surda* Zetterstedt, Dipt. Scand., 1845 IV p. 1476.—Zetterstedt, Dipt. Scand., 1860 XIV p. 6223.

*Limnophora surda* Stein, Ent. Nachr. 1892 XVIII No. 20-21 p. 324.—Stroble, Verh. zool.-bot. Gesell. Wien, 1894 (1893) XLIII p. 228.—Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII p. 208.—Stein, Wien. Ent. Zeitg., 1902 XXI Heft 2-3 p. 42.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 547.—Stein, Katalog Paläark. Dipt., 1907 III p. 674.—Stein, Arch. f. Naturgesch., 1914 (1913) Abt. A Heft 8 p. 27.—Stein, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 p. 110.—Ringdahl, Ent. Tidskr., 1918 XXXIX Nr. 2 p. 164. 178.—Malloch, Trans. Amer. Ent. Soc., 1918 XLIV No. 782 p. 275.—

Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 47. 58.

*Aricia (Limnophora) surda* Pandellé, Revue entom. France, 1899 XVIII p. 120.

*Limnophora (Spilogona) surda* Schnabl and Dziedziicki, Abh. d. Kaiserl. Leop.-Carol. Deutsch. Akadem. d. Naturforsch., 1911 XCV Nr. 2 p. 154.—Collin, Ent. Month. Mag., 1921 ser. 3 VII pp. 163. 215.—Séguy, Faune de France, No. VI 1923 p. 215.—Karl, Tierwelt Deutschlands, 1928 Th. XIII p. 99.—Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 279, pls. 17. 26.

*Spilogona surda* Hockett, Mem. 101 N. Y. (Cornell) Agric. Exp. Station, 1928 (1926) p. 834.

#### RECORDS:—

British Columbia, 1 ♂, Oliver, May 30 1923; 1 ♀, May 3 1923. (C. B. D. Garrett)

Alberta, 1 ♂, 2 ♀, Bannf, June 21 1922; 1 ♂, June 26 1922. C. B. D. Garrett) 1 ♂, Jasper, July 25 1926. (J. McDunough)

Manitoba, 1 ♂, Victoria Beach, Aug. 8 1926. (G. S. Brooks)

South Dakota, 1 ♂, Waubay, June 6 1918. (J. M. Aldrich)

Indiana, 1 ♂, Wells Co., May 17 1906. (E. B. Williams)

New York, 1 ♀, Ithaca, 19—.

Specimens of *surda* and *acuticornis* are commonly found together in many collections as either one or the other species, rarely have they been recognized as distinct. It is not unlikely that the species recorded by Stein (60) as *surda* represents a mixed series of these two species, the differences between which have been discovered in connection with the records of *acuticornis*.

Rondani (42) in 1866 designated *surda* Zetterstedt as the type of the genus *Melanochelia*. Pandellé (37) in 1899 recognized that Rondani's designation was founded on an error in identification, and that Rondani's specimens were not *surda* of Zetterstedt but represented a species hitherto not recognized. He re-named the specimens *exsurda*, which became the name of the *Melanochelia*. Meanwhile Coquillett (11) in 1901, evidently con-

struing Rondani's designation literally, listed *surda* Zetterstedt *nec* Rondani as the type of *Melanochelia*, an error which he corrected in a later list (12).

### *Limnophora (Spilogona) caroli* Malloch

*Limnophora caroli* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 154.

*Melanochelia caroli* Malloch, Canad. Ent. Soc., 1921 LIII pp. 63. 64.

*Spilogona caroli* Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII, 1925 p. 229.—Johnson, Ins. Fauna, Biol. Surv. Mt. Desert Region, 1927 p. 208.—Huckett, Mem. 101 N. Y. (Cornell) Agric. Exp. Station, 1928 (1926) p. 834.

The species is known from Vermont, Maine, New Hampshire, and New York, the type having been captured by Mr. C. W. Johnson on Mt. Ascutney, Vermont, on July 11th 1908.

The male has the eyes nearly as widely separated as in the female, and possesses well developed vertical bristles on head; in addition the hind femur has no series of bristles on proximal half of posteroventral surface. According to these characters the species is associated with *argenteiceps* Malloch, from which it differs in the male in that the pruinescence of the head is grayish drab, and not silvery, the fore tibia has a median posterior bristle, which is absent in *argenteiceps*, and the cheeks are narrower than in that species.

### *Limnophora (Spilogona) argenteiceps* (Malloch)

*Spilogona argenteiceps* Malloch, Psyche, 1924 XXXI No. 5 p. 200.—Johnson. Occ. Papers Boston Soc. Nat. Hist., No. VII, 1925 p. 229.

The species is known only from New Hampshire; the type, captured by Mr. C. W. Johnson, being labelled Mt. Washington, New Hampshire, at 4000 feet elevation, August 8 —.

The male possesses many of the diagnostic characters common to *caroli*, from which it differs specifically in the pruinescence and shape of the head, and in the armature of the fore tibia as indicated in the key.

***Limnophora (Spillogna) clarans* new species**

MALE, grayish species; parafrontals, parafacials, and cheeks silvery pruinulent with dark reflections; frontal vitta whitish pruinulent; antennae and palpi blackish; third antennal segment grayish tinged; frontal triangle whitish pruinulent; proboscis shining. Thorax with whitish pruinulence on mesonotum, opaque, with no vittæ when viewed from above and in front; when viewed from behind, with dark reflections, subshining: abdomen viewed from behind whitish pruinulent with dark reflections; terga 1+2 largely blackish, terga three and four with black subtriangular marks, tergum five with obscure dark reflections. Legs blackish, knees reddish, pulvilli tinged. Wings and calyptræ hyaline, whitish. Wings with veins pale yellow. Halteres yellow.

Eyes separated by a distance nearly equal to twice breadth of third antennal segment; frontal vitta but little narrowed caudad, distinctly separating profrontals throughout; parafrontals with six pairs of bristles which are widely interspaced, and which are continued in series caudad to level with ocellar callosity; ocellar and vertical bristles strongly developed, bristle-like; parafacials at base of antennae broader than width of third antennal segment, produced beyond a line drawn vertical from vibrissæ, narrowed ventrad; cheeks nearly as high as width of third antennal segment, the latter elongate, about three times as long as wide, apex reaching almost to a level with oral margin.

Thorax with presutural acrosticals setulose, with three pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:2.

Abdomen short, broadly conical; tergum three with paired subtriangular marks which are somewhat truncated cephalad and which are narrowly and obscurely separated at middle of dorsum; tergum four with paired subtriangular marks, smaller and more widely separated than those on tergum three.

Fore tibia with one posterior bristle: mid femur with 3 or 4 weak bristles on proximal half of posteroventral surface; mid tibia with no anterodorsal bristle, with 2 posterior bristles: hind femur with 3 bristles on distal third of anteroventral surface, posteroventral surface bare; hind tibia with 2 anteroventral, and 2 anterodorsal bristles, and with 1 shorter posterior bristle. Tarsi slender, pulvilli robust.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent toward margin of wing, *m-cu* cross vein sinuous.

Length, 4.75 mm.

RECORD:—1 ♂, Orillia, Ontario, June 21 1927. (C. H. Curran)  
Type in the Canadian National Collection, Ottawa.

The wings and calyptræ are hyaline and whitish as in *tristiola*, and the facial characteristics somewhat resemble those of the genus *Tetramerinx* in that the antennae are long and pendant,

and the vertical and ocellar bristles are strongly developed; however the arista is long and slender with slight pubescence, and the eyes are not so widely separated as in *Tetramerinx unica*. The abdomen resembles that of *Limnospila albifrons*. Terga 1+2 has a tuft of coarse bristles on the right-hand side of the abdomen only, which undoubtedly is an abnormality.

***Limnophora (Spilogona) cana* new species**

MALE, grayish; parafrontals, parafacials, and cheeks whitish pruinose with dark reflections; frontal vitta and frontal triangle with whitish pruinescence; antennae and palpi black; proboscis polished. Thorax with grayish white pruinescence, with no vittae: abdomen with grayish white pruinescence; terga three and four and five with paired grayish black reflective areas, not intensively marked; basal sclerite of hypopygium and fifth sternum lightly pollinose, subshining; ninth tergum reddish yellow. Legs blackish. Wings clear, veins light brown. Calyptæ whitish: halteres yellow.

Eyes separated by a distance nearly equal to length of third antennal segment; frontal vitta but little narrowed caudad; parafrontals with six or seven pairs of bristles, widely interspaced, continued in series caudad to a level with ocellar callosity; vertical and ocellar bristles strongly developed; parafacials at base of antennæ narrower than width of third antennal segment; cheeks about as high as breadth of third antennal segment, the latter about twice as long as broad.

Thorax with presutural acrosticals setulose, with three pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:2.

Abdomen with markings subtriangular, those on terga three and four truncated cephalad, subequal; those on tergum five much smaller than those on preceding segments, confined to caudal half of tergum, and not so widely separated.

Fore tibia with no posterior bristle: mid femur with 2 or 3 weak bristles at base of anteroventral surface, with 4 or 5 bristles or proximal half of posteroventral surface; mid tibia with no anterodorsal bristle, with 2 posterior bristles: hind femur with 5 bristles on distal half of anteroventral surface; hind tibia with 1 anteroventral, and 2 anterodorsal bristles. Tarsi long and slender, longer than their respective femur; pulvilli large.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent towards margin of wings. Length, 4.75 mm.

RECORD:—1 ♂, Mt. Adams, Washington, July 24 1921. (A. L. Melander)

Type in collection of the United States National Museum.

This species has the ocellar and vertical bristles in the male stoutly developed. Owing to its pale grayish color it conforms

somewhat in appearance to *clarans*, from which it may be readily separated by the much smaller third antennal segment, and the narrower parafacials. The markings on the abdomen are peculiar in that they appear as lightly imposed grayish refractive areas with no trace of deeper contrasting coloration.

***Limnophora (Spilogona) bisetosa* new species**

MALE, blackish; parafacials and cheeks whitish to brownish black pruinulent, with dark reflections; frontal vitta black, with brownish pruinulence; frontal triangle polished; proboscis lightly pollinose; antennæ and palpi black. Thorax largely black, subshining, with trace of brownish pruinulence, vittæ obscured. Abdomen with grayish white pruinulence, with dark reflections; terga 1+2 largely blackened, terga three, four and five with paired black marks, in addition the area between the tergal marks may be more or less infuscated, tending thereby to obscure the paired identity of such markings; basal sclerite of hypopygium and fifth sternum blackish, subshining. Legs black, pulvilli tinged. Wings infuscated, blackened basad. Calyptræ yellowish tinged, sometimes the upper scale whitish: halteres yellow.

Eyes separated by a distance about equal to breadth of third antennal segment; parafrontal bristles well developed, continued in series caudad to about level with apex of frontal triangle; parafacials at base of antennæ scarcely equal to breadth of third antennal segment, narrowed ventrad; cheeks fully equal to breadth of third antennal segment, well maintained caudad; with a number of coarse setulæ at base of vibrissæ; third antennal segment narrower than second segment, about 1.75 times as long as broad; arista with distinct short pubescence, the basal hairs longer than basal diameter of arista.

Thorax with presutural acrosticals setulose, in closely adjacent series; with three pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:1, or 1:2.

Abdomen narrowly conical; tergum three with marks trapezoidal, confined to dorsum; tergum four with markings subtriangular, narrower than those on tergum three and more widely separated; tergum five with obscure narrow triangular marks; fifth sternum deeply notched, processes with two or three fine, weak bristles apicad, the inner margins at apex with a small polished tubercular process.

Fore tibia with at most a fine weak posterior bristle: mid femur with a series of longish setulæ on anteroventral surface which become stouter proximad, with 2 stout spinelike bristles on basal third of posteroventral surface, occasionally a third weaker bristle; mid tibia with 1 anterodorsal, and 2 posterior bristles: hind femur with 3 or 4 bristles on distal half of anteroventral surface, posteroventral surface with no series of bristles;

hind tibia with 1 or 2 anteroventral, 2 or 3 anterodorsal bristles, and with the weaker posterior bristles not evident.

Wings with veins *R.* 4+5 and *M.* 1+2 slightly divergent toward wing margin.

FEMALE, paler than male, parafacials and cheeks grayish pruinulent; parafrontals with brownish infuscation; frontal vitta brownish pruinulent. Thorax grayish pruinulent, with three brownish vittæ, and with more or less lateral infuscation on mesonotum; scutellum with brownish marks at basal angles. Abdomen grayish pruinulent, with paired brownish marks on terga 1+2, three, and four; tergum five with a brownish dorsocentral vitta. Wings clear, with traces of infuscation along *r-m* and *m-cu* cross veins, and at base of wing membrane.

Parafrontals with numerous setulæ; parafacials at base of antennæ as wide as breadth of third antennal segment, narrower ventrad; cheeks higher than breadth of third antennal segment, the latter twice as long as wide; arista short pubescent. Abdomen with paired marks on terga 1+2, terga three and four with subtriangular marks, broadly separated; ovipositor with spinules on anal plates.

Fore tibia with no posterior bristle: mid femur with 2 erect bristles on basal third of posteroventral surface; mid tibia with 5 anterodorsal, and 2 posterior bristles: hind femur with 3 or 4 bristles on distal half of anteroventral surface; hind tibia with 1 or 2 anteroventral, and 2 or 3 anterodorsal bristles, with weaker bristles on posterior surface not evident.

Wings with costal thorns well developed; veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin.

Length, 5-5.75 mm.

Type and allotype in the United States National Museum.

RECORDS:—

Washington, 1 ♂, Seattle, June 17 1917. (H. G. Dyar) 1 ♂, Lake Chelan, Lucerne, July 29 1919; 1 ♂, Ramparts, Mt. Rainier, Aug. 1 1922; 1 ♂, Ilwaco, July 1918. (O. H. Miner) 1 ♂, Lake Stephens, Everett, Aug. 3 1917. (A. L. Melander) 1 ♂, Ilwaco, July 1917. (J. M. Aldrich) 1 ♂, Ilwaco, July 12 1918. (A Spuler)

Oregon, 1 ♂, 1 ♀, Marshfield, June 1927. (J. M. Aldrich)

Idaho, 1 ♂, Mt. Moscow, July 5 1919. (A. L. Melander)

1 ♀, Mt. Moscow, July 25 1920. (R. C. Shannon) 1 ♂,

Mt. Moscow, July 17 1924. (J. M. Aldrich)

In the males of the above series there is a considerable variation in the shape of the abdominal marks, and in the degree of infuscation along dorsum. On tergum three the markings are

typically trapezoidal, and narrowly separated at middle of dorsum; in a few specimens the markings are completely fused across the dorsocentral plane, whilst in others the separation is considerably obscured owing to the degree of infuscation; tergum four has the markings typically subtriangular, being more widely separated than those on tergum three; in certain specimens the triangular marks on tergum three may be more or less truncated at cephalic margin of segment.

The males may be distinguished from those of allied species through the possession of two stout erect bristles on posteroventral surface of mid femur, the lack of bristles on posteroventral surface of hind femur, and in having three pairs of postsutural dorsocentral bristles. The parafacials are comparatively narrow.

The females of *bisetosa* resemble those of *sudra* and *acuticornis* in that the anal plates are armed with spinules, but the former differs from the latter in having the parafacials less prominent in profile, and in having the preapical bristles of scutellum well developed and the setulose hairs on lateral declivities of scutellum lacking.

***Limnophora (Spilogona) bisetosa* var. *pruinella* new variety**

MALE, grayish; parafrontals and parafacials silvery pruinose; cheeks with duller pruinescence; frontal vitta black; antennæ and palpi black; proboscis lightly pollinose. Thorax with a narrow brownish dorsocentral vitta, and with broad, brownish black infuscation laterad of dorsocentral bristles; the narrow space between the dorsocentral bristles and dorsocentral vitta distinctly paler in color, concolorous with humeral and notopleural callosities; scutellum grayish with large brownish areas at basal angles. Abdomen densely grayish pollinose with blackish reflections, with relatively small, paired, blackish marks on terga 1+2, three, and four; tergum five with a brownish dorsocentral vitta; basal sclerite of hypopygium densely grayish pollinose. Legs blackish, pulvilli tinged. Wings brownish tinged, but little if any more densely infuscated basad; *m-cu* cross vein faintly clouded.

Eyes separated by a distance greater than breadth of third antennal segment; frontal vitta distinctly though narrowly separating the parafrontals caudad; parafrontal bristles well developed, continued in series caudad to about level with apex of frontal triangle; parafacials at base of antennæ as wide as breadth of third antennal segment, considerably constricted ventrad; cheeks well maintained caudad, about equal in height to three-quarters length of third antennal segment; arista short pubescent.



Thorax with presutural acrosticals setulose; with three pairs of post-sutural dorsocentral bristles; sternopleural bristles arranged 1:2.

Abdomen cylindrico-conical; tergum three with trapezoidal marks; tergum four with smaller, subtriangular marks, more widely separated than on tergum three; hypopygium, fifth sternum, and chaetotaxy of legs very similar to that of *bispinosa*.

Length, 6 mm.

RECORDS:—

1 ♂, Glenwood, Washington, June 27 1917. (A. L. Melander)

1 ♂, Mt. Home Canyon, S. Bernardino Mts. California, June 8 1924. (J. M. Aldrich)

Type in the United States National Museum.

This variety is evidently a lighter form of the previous species. There are very few, if any, structural differences between the specimens of each series. In *pruinella* the eyes are a little wider apart and the parafacials and cheeks more pronounced than in the males of *bispinosa*. The wings in the male of *pruinella* have only a trace of infuscation; the basal sclerite of hypopygium is densely grayish pollinose, opaque, and the scutellum and abdomen are more largely grayish pruinose, whereas in *bisetosa*, the male has the wings intensively infuscated basad, the basal sclerite of hypopygium, and scutellum are entirely blackish and shining.

*Limnophora (Spilogona) rufitibia* Stein

*Limnophora rufitibia* Stein, Arch. f. Naturgesch., 1920 (1918)

Abt. A Heft 9 pp. 46. 52.

*Spilogona rufitibia* Hockett, Mem. 101 N. Y. (Cornell) Agric.

Exp. Station, 1928 (1926) p. 834.

RECORDS:—

Idaho, 1 ♂, Mt. Moscow, July 25 1920. (R. C. Shannon) 1 ♂,

Mt. Moscow, July 8 1911; 1 ♂, July 6 1912. (J. M. Aldrich)

1 ♂, Lake Waha, June 9 1916. (A. L. Melander)

New York, 2 ♀, McLean, Sept. 11 1920: 1 ♀, Montezuma

Marshes, Cayuga, July 1 1920: 1 ♂, Hempstead, Long

Island, June 5 1921: 1 ♂, 1 ♀, Lakeville, Long Island, May

22 1921: 2 ♀, Valley Stream, Long Island, April 27 1921.

Rhode Island, 1 ♂, Button Woods, June 22.

New Hampshire, 1 ♀, White Mountains, no date. (Morrison)

Nova Scotia, 1 ♀, Truro, July 26 1913. (R. Matheson)

I find that this species is frequently mistaken for *suspecta* Malloch in many collections, from which it may be readily separated in both sexes by the possession of three fine setulose hairs on dorsal margin of lateral declivities of scutellum adjacent the apical bristles. These are lacking in *suspecta*.

In the male the species may be further recognized by the following characters, a) parafrontal bristles not continued in series to a level approximating that of anterior ocellus, b) processes of fifth sternum are truncated at apex, the border of which is glossy and shining, c) the abdominal marks are poorly defined, being more or less reflective areas as the abdomen is shifted in its position and relation to the light.

In the case of *suspecta* the parafrontal bristles are continued in a series caudad to a level with frontal triangle, the processes of fifth sternum are not truncated at apex, the margin being more or less broadly rounded with a slight angular outline on inner margin, the abdominal marks are distinct and are readily recognized.

In the female of *rufitibia* the mid tibia has no anterodorsal bristle, and the fore tibia has no median posterior bristle; whereas in the female of *suspecta* both these bristles are present.

### ***Limnophora (Spilogona) suspecta* Malloch**

*Limnophora suspecta* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 154.

*Melanocheilia suspecta* Malloch, Canad. Ent., 1921 LIII p. 63.

*Spilogona suspecta* Johnson, Occ. Pap. Boston Soc. Nat. History, No. VII, p. 229.

#### RECORDS:—

Nova Scotia, 1 ♂, Kentville, July 28 1924; 1 ♀, Digby, Aug. 21 1913. (R. P. Gorham) 1 ♀, Bridgetown, Sept. 2 1912. (G. E. Saunders) 1 ♀, West River, July 24 1913. (R. Matheson)

New Brunswick, 1 ♀, Fredericton, Aug. 3 1913: 1 ♂, June 21 1914. (J. D. Tothill) 1 ♂, Red Rapids, July 23 1913. (R. P. Gorham)

Quebec, 1 ♂, Kazubazua, July 20 1927. (G. S. Walley)

Maine, 1 ♂, Capens, July 21 —: 1 ♂, Mt. Katahdin, summit elev. 5215 ft. Aug. 19 1902.

New Hampshire, 2 ♀, Mt. Washington, no date.; 1 ♀, White Mountains, no date. (Morrison)

British Columbia, 2 ♂, Carbonate Columbia River, July 7-12 1908, alt. 2600 ft. (J. C. Bradley)

This species closely resembles *rufitibia*, with which it has already been compared.

***Limnophora (Spilogona) fimbriata* new species**

MALE, blackish; parafrontals and parafacials whitish pruinose, with dark reflections; cheeks drab, grayish, not so highly pruinose; frontal vitta black with whitish pollen; antennæ and palpi black; frontal triangle and proboscis polished. Thorax blackish, subshining, with trace of darker dorsocentral and sublateral lines, paler grayish on cephalic half of presutural area and laterad on humeral and notopleural callosities; scutellum entirely blackish. Abdomen with dense grayish pruinoscence, and darker reflections; terga 1+2 largely blackish, terga three and four each with a pair of blackish marks, tergum five with a brownish fuscous dorsocentral vitta; basal sclerites of hypopygium lightly pollinose. Legs black, pulvilli brownish tinged. Wings hyaline, veins brownish black. Calyptæ whitish, the under scale with distinctly yellowish margin: halteres yellow.

Eyes separated by a distance slightly greater than diameter of anterior ocellus; frontal vitta interrupted caudad by the contiguity of parafrontals; parafrontal bristles well developed, the series extending caudad to a level with narrowest part of frons; parafrontals at base of antennæ scarcely equal to breadth of third antennal segment; cheeks, in height, fully equal to breadth of third antennal segment, the latter slightly longer than second segment; arista minutely pubescent.

Thorax with presutural acrosticals setulose, in two more or less irregular series; with three pairs of postsutural dorsocentral bristles; scutellum with a few setulose hairs on dorsal margin of lateral declivities adjacent the apical bristles; sternopleural bristles arranged, 1: 2.

Abdomen conical, markings on terga three and four broadly separated, restricted to dorsum, well defined, those on tergum three trapezoidal, those on tergum four subtriangular; tergum five with ill defined dorsocentral markings; fifth sternum broadly emarginate, with numerous fine longish bristles.

Fore tibia with or without a posterior bristle, and with a weak apical posteroventral bristle: mid femur with a series of 5 or 6 bristles on proximal half of posteroventral surface; mid tibia with no anterodorsal, and with 2 posterior bristles: hind femur with a series of 3 or 4 bristles on distal half of anteroventral surface, and with a series of longer, finer bristles on proximal half, the latter increasing in length basad, with a

similar series of long fine bristles on proximal half of posteroventral surface; hind tibia with 1 or 2 anteroventral, and 1 or 2 anterodorsal bristles, the posterior surface with 1 or 2 setulose bristles.

Wings with veins *R.* 4+5 and *M.* 1+2 slightly divergent towards wing margin.

Length, 5 mm.

RECORDS:—

2 ♂, Cranbrook, British Columbia, June 21 1926. (A. A. Dennys)

1 ♂, Waterton, Alberta, July 14 1923. (H. L. Seamans)

Type in the Canadian National Collection, Ottawa.

The species closely resembles *baltica* Ringdahl in that the hind femur in male has noticeably long fine bristles on proximal half of posteroventral surface, and the scutellum has the fine setulose hairs on dorsal margin of lateral declivities of scutellum adjacent the apical bristles. However in *fimbriata* the bristles on proximal half of anteroventral surface of hind femur are equally long and fine, longer than those on distal half; whereas in *baltica* these bristles are much shorter than those on the posteroventral surface, and than those on distal half of anteroventral surface of hind femur.

The specimen from Waterton was sent to Mr. Ringdahl for examination, who very kindly loaned me a Swedish specimen of *baltica* for further study.

***Limnophora (Spilogona) pluvialis* new species**

MALE, grayish black; parafrontals and parafacials with whitish pruinescence, and with dark reflections; cheeks with brownish pruinescence; frontal vitta black, viewed from below with brownish pollen; frontal triangle polished; proboscis lightly pollinose, subshining; antennæ and palpi black. Thorax with mesonotum largely grayish black, with trace of brownish pruinescence, humeral and notopleural callosities pale gray, vittæ obscured; scutellum entirely blackish; pleura blackened. Abdomen largely blackish, terga 1+2 entirely blackish, tergum three similar to terga 1+2, with a trace of grayish pruinescence at cephalolateral angles and along the dorso-central plane; tergum four more grayish pruinulent than tergum three, the blackish marks smaller and more distinctly separated; tergum five with no definite markings, largely blackish, infuscated; basal sclerite of hypopygium with trace of pruinescence, subshining. Legs brownish black, pulvilli tinged. Wings lightly infuscated, more densely so basad; calyptræ tinged; halteres deep yellow, with trace of purple.

Eyes separated by a distance slightly less than breadth of third antennal segment; frontal vitta constricted to lineal dimensions caudad, separating the parafrontals; parafrontal bristles continued in series caudad to a level with narrowest constriction between the eyes; parafacials at base of antennæ nearly equal to breadth of third antennal segment; cheeks in height about equal to three-quarters length of third antennal segment, somewhat restricted throughout caudal half by the upward curvature of the ventral margin of head capsule.

Thorax with presutural acrosticals setulose, in two closely adjacent series, with three pairs of postsutural dorsocentral bristles; sternopleural bristles arranged, 1: 1. Scutellum with setulose hairs on dorsal margin of lateral declivities adjacent apical bristles.

Abdomen narrowly conical, terga three and four with more or less paired trapezoidal marks which are broader than long, occasionally such markings on either tergum may be fused across the dorsocentral plane; sternum five deeply notched, with 1 or 2 longish weak bristles at apex of processes.

Fore tibia with or without a fine weak posterior bristle: mid femur with a series of short weak bristles on proximal half of anteroventral surface, and with a series of longish bristles on proximal two-thirds of posteroventral surface; mid tibia with or without an anterodorsal bristle, and with 2 or 3 longish posterior bristles: hind femur with 4 or 5 longish bristles on distal half, and with 5 or 6 much weaker and shorter bristles on proximal half of anteroventral surface, with a series of short bristles on proximal half of posteroventral surface; hind tibia with 1 to 3 anteroventral, and with 2 or 3 anterodorsal bristles, with or without 1 or 2 weaker posterior bristles.

Wings with a series of prominent costal setulæ proximad of costal thorn; veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin, *m-cu* cross vein erect.

FEMALE, similar to male; parafrontals, parafacials, and cheeks brownish gray pruinose, more densely so on parafrontals; frontal vitta brownish pollinose; thorax with mesonotum, scutellum, and pleura more brownish infuscated than in male; abdomen subshining, with large brownish markings on terga 1+2, three, and four; tergum five with trace of brownish dorso-central vitta. Wings clear; veins brownish.

Parafrontals with numerous setulæ; parafacials, at base of antennæ, broader and cheeks higher than width of third antennal segment; sternopleural bristles arranged, 1: 2. Abdomen with large, paired subtriangular marks on terga three and four, the outlines of which are poorly defined; abdominal bristles well developed; ovipositor with fine setulæ on anal plates.

Fore tibia with or without a posterior bristle: mid femur with a series of 4 or 5 bristles on proximal half of posteroventral surface; mid tibia with 1 anterodorsal, and 2 posterior bristles: hind femur with 5 or 6 bristles on distal half of anteroventral surface, posteroventral surface with a series of short weak bristles on proximal half; hind tibia as in male.

Wings with a series of robust costal setulæ proximad of costal thorns.  
Length, 4.5 mm.

RECORDS:—

1 ♂, 1 ♀, Paradise Park, Mt. Rainier, Washington, July 27 1922; 2 ♂, 2 ♀, August 1917; 1 ♂, 1 ♀, Crystal Mountain, Mt. Rainier, Washington, Aug. 3 1922; 1 ♂, 1 ♀, Sluisin, Mt. Rainier, Washington, July 28 1922; 1 ♂, Ind. Henry, Mt. Rainier, Washington, Aug. 2 1922. (A. L. Melander)

Type and allotype in the United States National Museum.  
Paratypes in Canadian National Collection.

This species is not readily comparable to others in the genus. The males agree with those of *crepusculenta*, *comata*, and others in having the thoracic pleura blackened, darker in coloration than mesonotum. On the other hand the thorax in male and female has three pairs of postsutural dorsocentral bristles, and the halteres are yellow; in addition the scutellum has fine setulose hairs on dorsal margin of lateral declivities adjacent apical bristles, and the costal setulæ are prominently developed proximad. There is a considerable degree of variation in the intensity of abdominal infuscation in the male making it a difficult matter to recognize any definite marks: in the female there is a considerable variation in the degree of development of the setæ on the posteroventral surface of hind femur, the interpretation of which is none too easy owing to their setulose character in most specimens.

***Limnophora (Spilogona) baltica* Ringdahl**

*Limnophora fumipennis* Stein not Zetterstedt, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft p. 101.—Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 p. 56.

*Limnophora baltica* Ringdahl, Ent. Tidskr., 1918 XXXIX Nr. 2 p. 165.

*Limnophora (Spilogona) baltica* Karl, Tierwelt Deutschlands, 1928 Th. XIII p. 99.—Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 277, pls. 17. 27.

Male blackish; parafrontals and parafacials silvery pruinescens; cheeks with brownish pruinescence; antennæ and palpi black. Mesonotum largely blackened, with trace of brownish

pruinescence and darker lines along the dorsocentral and sub-lateral planes; humeral and notopleural callosities pale grayish. Abdomen grayish pruinescent, terga 1 + 2 largely blackish, terga three and four with large paired black marks, tergum five with a pair of narrow blackish marks between which the surface is brownish infuscated; basal sclerite of hypopygium grayish pollinose. Legs black. Upper calyptra whitish, under calyptra brownish tinged. Halteres yellow.

Eyes separated by a distance about equal to that between posterior ocelli exclusive; parafrontals contiguous; parafrontal bristles well developed, continued in series caudad to level with frontal triangle; parafacials barely equal to width of third antennal segment, narrowed ventrad; cheeks fully as high as breadth of third antennal segment, with a series of upturned setulose bristles along ventral border.

Thorax with presutural acrosticals in two adjacent series, comprising four irregularly paired weak bristles and one or two accessory setulæ; the presutural area between the dorsocentral bristles significantly devoid of setulæ, with one or two setulæ adjacent the dorsocentral bristles and the transverse suture; acrosticals well developed, stouter than the adjacent setulæ; scutellum with two longish setulæ on dorsal margin of lateral declivities adjacent the apical bristles; mesopleural series of bristles with no intermediate predorsal bristle; with three pairs of postsutural dorsocentral bristles.

Abdomen similar to that of *alticola* Malloch, conical and deep; abdominal marks confined to dorsum; tergum three with a pair of quadrilateral marks, each as broad along cephalic as along caudal margin, the inner margins slightly convergent cephalad; tergum four with smaller subtriangular marks, the inner margins convergent caudad; tergum five with marks reduced to two narrow dorsal strips, which are confined to caudal half of surface; fifth sternum with broad, flat, processes, each clothed with a few fine bristles.

Fore tibia with a weak apical posteroventral bristle, and with no posterior bristle: mid femur with a series of 5 or 6 weak bristles on proximal half of anteroventral surface, and with a series of 7 or 8 bristles on proximal half of posteroventral sur-

face; mid tibia with 2 posterior bristles: hind femur with a complete series of anteroventral bristles, of which 4 or 5 on distal half are strongly developed, and 6 to 8 on proximal half are fine and shorter, increasing in length proximad, posteroventral surface with a series of long fine bristles on proximal half, the longest of which exceed in length the breadth of femur where situated; hind tibia with 1 or 2 anteroventral, and 2 anterodorsal bristles, the setulose bristles on posterior surface obscure, apical anterodorsal bristle weakly developed, apical posterodorsal bristle setulose.

Wings smoky, more densely infuscated basad; *m-cu* cross vein almost straight; veins *R.* 4 + 5 and *M.* 1 + 2 slightly divergent distad.

Length, 5 mm.

This species was recorded by Stein (60) from Idaho as *fumipennis* Zetterstedt. In a footnote Stein mentions that in the opinion of Ringdahl the species thus named was not conspecific with that of Zetterstedt. Earlier, Ringdahl (39) had proposed the name *baltica* for Stein's species, and had placed *fumipennis* as a synonym of *contractifrons* Zetterstedt. I have not seen Stein's North American specimens of this species. Mr. Ringdahl has very kindly furnished me with a Swedish specimen of *baltica*, which has formed the basis for this study.

The male of this species resembles most closely those of *fimbriata* and *reflecta* (p. 208). From the former species it may be separated by the lack of long fine bristles on proximal half of anteroventral surface of hind femur, and from the latter by the presence of a series of longish fine bristles on proximal half of posteroventral surface of hind femur.

### *Limnophora* (*Spilogona*) *gibsoni* Malloch

*Limnophora gibsoni* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI  
No. 802 p. 152.

*Melanocheilia gibsoni* Malloch, Canad. Ent., 1921 LIII pp. 62. 64.

RECORDS:—

New Brunswick, 1 ♂, St. Leonards, June 30 1914. (F. M. McKenzie)



New Hampshire, 1 ♂, near summit of Mt. Washington, July 13, 1895. (Geo. Dimmock) 1 ♀, base of Mt. Washington, 2600 ft. Aug. 27, 1914. (C. H. T. Townsend) 1 ♀, Mt. Washington, no date. (Mrs. Slosson)

New York, 1 ♀, Whiteface Mt. Adirondaeks, 3800 ft. July 4.— (J. M. Aldrich) 1 ♀, Cooperstown, June 22, 1921.

Alberta, 1 ♀, Waterton, July 2, 1924. (H. L. Seamans)

The species superficially resembles *magnipunctata* Malloch, especially in the male sex in that the wings are more or less infuscated, being blackened basad. It can however be readily separated from this species in that the hind femur has a few bristles on the median third of posteroventral surface, and the abdominal markings are restricted to the dorsum; whereas in the case of *magnipunctata* the hind femur has no well developed bristles on posteroventral surface, and the abdominal markings are expansive. In these respects the male resembles that of *alticola*, in which species the processes of the fifth abdominal sternum are broad and rounded apicad, the fore tibia has usually a posterior bristle, and the wings are at most lightly infuscated basad; whereas in *gibsoni* the processes of fifth abdominal sternum are narrowly tapering apicad, and the fore tibia has no posterior bristle.

The female of *gibsoni* has two to four weak bristles on median third of posteroventral surface of hind femur as in male, one or two ventral bristles on the mid tibia, the calyptre are intensively yellowish, and the eyes are less broadly separated than usual, the distance at middle of frons being about equal to that separating the anterior and posterior sternopleural bristles.

***Limnophora (Spilogona) contractifrons* var. *fumipennis***  
(Zetterstedt)

*Aricia fumipennis* Zetterstedt, Dipt. Scand., 1845 IV p. 1465.

*Limnophora fumipennis* Stein, Katalog Paläark. Dipt., 1907 III p. 671.

*Limnophora contractifrons* Ringdahl in part, Ent. Tidskr., 1918 XXXIX p. 159.

RECORDS:—

Alaska, 1 ♂, 1 ♀, Naknek Lake, Savonoski, July 27, 1919; 1 ♀, July 31, 1919; 2 ♀, July 1919; 1 ♀ August 1, 1919; 1 ♀, Aug.

14, 1919; 2 ♀, Snug Harbor, June 8, 1919. (J. S. Hine)  
 1 ♂, Hurricane, July 15, 1921; 1 ♂, Kukak Bay, July 4,  
 1899. (T. Kincaid)

Labrador, 1 ♂, 1 ♀, Ungava Bay, July 22. (L. M. Turner)  
 New Hampshire, 1 ♂, White Mts., no date. (Morrison)

The male specimens before me of this subspecies may be readily recognized by the characteristic shape of the abdomen, which is uniformly deep from base to apex and is noticeably compressed laterad. In this respect they are typical of *contractifrons*, from which they vary in that the wings are not hyaline but are tinged throughout with brownish infuscation. Collin (6a) has considered the species a synonym of *arctica* Zetterstedt.

### Limnophora (Spilogona) alticola Malloch

*Limnophora alticola* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI  
 No. 802 p. 153.

*Melanochelia alticola* Malloch, Canad. Ent., 1921 LIII p. 64.

*Spilogona alticola* Malloch, Psyche, 1924 XXXI No. 5, p. 201.—  
 Johnson, Occ. Papers Boston Soc. Nat. Hist., No. VII 1925  
 p. 229.—Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region,  
 1927 p. 208.—Huckett, Mem. 101 N. Y. (Cornell) Agric. Exp.  
 Station, 1928 (1926) p. 834.

#### RECORDS:—

Quebec, 1 ♂, Bradore Bay, July 19, 1929; 1 ♂, July 21, 1929;  
 1 ♂, 2 ♀, July 17, 1929; 4 ♂, 3 ♀, July 27, 1929; 2 ♀, Mutton  
 Bay, July 11, 1929; 1 ♂, Bonne Esperance, July 14, 1929.

(W. J. Brown) 1 ♀, Roberval, July 28, 1915. (G. Beaulieu)  
 1 ♀, Meach Lake, June 21, 1916.

New Brunswick, 1 ♀, Fredericton, July 17, 1912; 1 ♀, June 21,  
 1914. (J. D. Tothill)

Maine, 1 ♂, Bar Harbor, June 13, 1921. (C. W. Johnson)

New Hampshire, 1 ♂, Mt. Washington, 3000 ft. July 8, 1919.

Vermont, 1 ♀, Mt. Equinox, June 5, 1910.

Massachusetts, 1 ♂, Mt. Greylock, June 14, 1906.

Ontario, 1 ♂, 1 ♀, Sand Lake, June 30, 1926. (F. P. Ide) 1 ♂,  
 Orillia, June 16, 1927. (C. H. Curran) 1 ♂, Waubamic,  
 June 14, 1914; 1 ♂, June 14, 1915. (H. S. Parish) 2 ♂,

Waubanic, Parry Sound, June 8, 1915. (J. M. Aldrich)

1 ♀, Lake Abitibi, Low Bush, July 14, 1925. (N. K. Bigelow)

New York, 10 ♂, Whiteface Mt. Adirondacks, 3800 ft. July 4, 1921. (J. M. Aldrich) 1 ♀, Ringwood, Ithaca, June 26,

1920; 1 ♀, Cranberry Lake, July 2, 1917. (C. J. Drake)

Alberta, 1 ♂, Banff, June 20, 1922. (C. B. D. Garrett)

This species agrees very closely with the references by authors to *contractifrons*. Specimens sent to European workers have invariably been returned with a note expressing its similarity to *contractifrons*. I find however, as indicated by Malloch (31), that there are significant differences in the structure of the parts composing the axial system of the male genitalia of *alticola* and *fumipennis*, which cause me to doubt whether this species is as closely related to *contractifrons* as its external appearance would suggest.

The species *contractifrons* has been reported from Greenland by Staeger (53) and Lundbeck (22), and is listed in the catalogues of North American diptera by Osten Sacken (36) and Aldrich (1). I am unable to verify these records from North America, partly owing to the lack of authenticated specimens of *contractifrons*.

#### ***Limnophora (Spilogona) pulchra* new species**

MALE, parafrontals and parafacials silvery pruinulent; cheeks whitish pruinulent, with dark reflections; frontal vitta, viewed from below with whitish pollen; frontal triangle polished; proboscis lightly pollinose, subshining; antennæ deep black; palpi blackish. Thorax grayish pruinulent, the presutural area with a brownish dorsocentral vitta, the sublaterals more indistinct and narrower than the median vitta, the postsutural area with brownish infuscation between the dorsocentral bristles and laterad of intralar bristles; scutellum blackish, dorsal half of mesopleura blackish infuscated. Abdomen with grayish pruinulence, all terga with paired blackish marks, those on terga 1+2 and on five fused in part across the dorsocentral plane; basal sclerite of hypopygium blackish, subshining, with trace of grayish pruinulence. Legs blackish; pulvilli tinged. Wings with trace of infuscation, but little darker basad; veins brownish. Calyptræ whitish; halteres yellow.

Eyes separated by a distance slightly greater than maximum breadth of third antennal segment; frontal vitta narrowed caudad, distinctly separating the parafrontals; the latter with six pairs of bristles, which are con-

tinued in series caudad to about a level with apex of frontal triangle, the caudal three pairs of bristles weaker and shorter than the cephalic three pairs of series; parafacials at base of antennæ about equal in breadth to average width of third antennal segment; cheeks well maintained caudad, in height fully equal to three quarters length of third antennal segment, the latter tapering distad; arista slightly swollen at base, pubescence on proximal half about equal to diameter at base of arista.

Thorax with presutural arosticals setulose; with three pairs of post-sutural dorsocentral bristles; sternopleural bristles arranged, 1: 2.

Abdomen cylindrical, with markings confined to dorsum of each tergum; tergum three with marks subquadrate, longer than broad; tergum four with subtriangular marks; tergum five with subtriangular marks which are not so well defined as those on tergum four, the inner margins tending to approximate caudad; sternum five with deep notch, the processes with a number of long black bristles apicad, the inner border clothed with numerous fine setulæ.

Fore tibia with no posterior bristles: mid femur with 1 bristle at base, the antero- and posteroventral surfaces with a series of fine setulæ; mid tibia with 1 anterior and 3 posterior bristles: hind femur with 4 or 5 bristles on distal half of anteroventral surface, with no series of weak bristles on proximal half of posteroventral surface; hind tibia with 3 or 4 anteroventral, and 1 or 2 anterodorsal bristles, and with 1 or 2 weaker posterior bristles. Tarsi long and slender, mid tarsi as long as hind tarsi, fore tarsi shorter than mid tarsi.

Wings with *R.* 4+5 and *M.* 1+2 veins slightly divergent towards wing margin.

Length, 5.5 mm.

#### RECORD:—

1 ♂, Fairbanks, Alaska, July 1, 1921. (J. M. Aldrich)

Type in the United States National Museum.

The species may be distinguished in the male sex by the unusual presence of several well developed bristles at apex of processes of fifth abdominal sternum, and by the lack of bristles on posteroventral surface of mid femur.

#### *Limnophora* (*Spilogona*) *anthrax* Bigot

*Limnophora anthrax* Bigot, Ann. Soc. Ent. France, 1885 (1884) ser. 6 V p. 274. Van der Wulp, Biolog. Centr.-Americana, 1896 II p. 347.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 546.—Stein, Arch. f. Naturgesch., 1919 (1917) Abt. A Heft I p. 133.

*Limnophora squamosa* Stein, Arch. f. Naturgesch., 1920 (1918)  
Abt. A Heft 9 pp. 46. 53.

*Melanocheilia anthrax* Malloch, Canad. Ent., 1921 LIII p. 63.

RECORDS:—

Alaska, 1 ♂, Seward, July 26, 1921; 1 ♂, Anchorage, July 21, 1921; 1 ♂, July 20, 1921. (J. M. Aldrich) 1 ♂, Yakutat, June 21, 1899. (Harriman Alaska Exped., T. Kincaid)

British Columbia, 1 ♂, 1 ♀, Revelstoke Mountain, elev. 6000 ft. Aug. 12, 1923. (P. N. Vroom)

Alberta, 1 ♂, Laggan, July 22, 1901; 1 ♂, Waterton, July 12, 1923. (H. L. Seamans) 1 ♂, Waterton Lakes, June 22, 1923. (J. McDunnough)

Oregon, 1 ♂, Mt. Hood, July 29, 1921 (W. Downes)

Washington, 1 ♂, Mt. Adams, July 24, 1921; 1 ♂, Mt. Rainier, Van Trump Creek, Sept. 1, 1917; 2 ♂, July 21, 1922; 4 ♂, 3 ♀, Eagle Park, Mt. Rainier, July 19, 1922; 2 ♂, 1 ♀, Aug. 25, 1921; 10 ♂, 7 ♀, Fairfax Trail, Mt. Rainier, Aug. 9, 1922; 1 ♂, Sluiskin, Mt. Rainier, July 28, 1922; 1 ♂, Hanson Camp, Mt. Rainier, July 31, 1922; 2 ♂, Paradise Park, Mt. Rainier, Aug. 1917. (A. L. Melander)

Idaho, 1 ♂, Cavanaugh B., Priest Lake, Aug. 18, 1919; 2 ♂, Lookout Mt., Priest Lake, Aug. 20, 1919. (A. L. Melander)

Montana, 1 ♂, Lake Macdonald, Glacier Park, Aug. 14, 1916. (A. L. Melander)

The species was described by Bigot from the male sex only, and from material captured in Mexico. The male may be readily recognized in that the calyptæ are intensively infuscated throughout, as in *narina* and *concolor*. The latter however have usually four pairs of postsutural dorsocentral bristles, whereas in *anthrax* the usual number is three. The female of *anthrax* closely resembles that of *magnipunctata* Malloch, from which it is not readily separated. In *anthrax* the calyptæ of the female are intensively yellowish, and the parafacials are comparatively narrow when viewed in profile.

***Limnophora (Spilogona) magnipunctata* Malloch**

*Limnophora magnipunctata* Malloch, Proc. Cal. Acad. Sci., 1919 ser. 4 IX No. 11 p. 301.

*Limnophora fumosa* Stein, Arch. f. Naturgesch., 1920 (1918)  
Abt. A Heft 9 pp. 47. 48.

*Melanochelia magnipunctata* Malloch, Canad. Ent., 1921 LIII  
p. 64.

*Spilogona magnipunctata* Hockett, Mem. 101 N. Y. (Cornell)  
Agric. Exp. Station, 1928 (1926) p. 834.

RECORDS:—

1 ♂, 1 ♀, Katmai, July 1917; 1 ♀, Aug. 1917. (J. S. Hine)

1 ♂, Kukak Bay, July 4, 1899; 1 ♂, Popoff Island, July 8,  
1899; 1 ♂, July 10, 1899; 1 ♀, July 11, 1899; 1 ♀, July 13,  
1899; 1 ♀, July 14, 1899; 1 ♂, Kadiak Island, July 20, 1899;  
1 ♂, July 30, 1899. (Harriman Alaska Exped., T. Kincaid)

British Columbia, 1 ♂, 1 ♀, Mt. Cheam, Aug. 5, 1903; 1 ♀,  
Minniel, July 26, 1925. (E. R. Buckell) 1 ♀, Hedley, Aug.  
29, 1923. (C. B. D. Garrett) 2 ♂, 2 ♀, Carbonate to Prairie  
Hills, July 12–18, 1908; 2 ♀, Goldstream to Downie Creek,  
Selkirk Mts., Aug. 7–11, 1905. (J. C. Bradley)

Alberta, 1 ♂, 1 ♀, Waterton, July 1, 1924; 2 ♂, June 30, 1924;  
1 ♂, July 11, 1923; 1 ♀, Aug. 13, 1922. (H. L. Seamans)

Washington, 1 ♂, Seattle, May 25, 1919. (J. S. Hine)

California, 3 ♂, Alta Meadow, Seq. Nat. Park, July 19, 1907,  
elev. 9000 ft. (J. C. Bradley)

The above series of specimens exhibit a wide degree of variation in size, coloration of calyptreæ, and width of parafacials. The mid tibiæ in some specimens have a posteroventral bristle, which in others is absent. I have been unable to recognize any external structure whereby the males of *magnipunctata* differ from those of *anthrax*, and in the female the two species are still more difficult to separate.

***Limnophora (Spilogona) reflecta* new species**

MALE, with parafrontals, parafacials, and cheeks brownish pruinose, with dark reflections; frontal vitta reddish cephalad; frontal triangle polished; proboscis lightly pollinose, subshining; antennæ and palpi black. Thorax viewed from above and behind blackish, subshining, vittæ obscured, with trace of brownish pruinescence. Abdomen densely grayish brown pruinose; terga 1+2 largely brownish black; terga three and four with paired blackish marks; tergum five with brownish pruinescence and trace of darker markings caudad; basal sclerite of hypopygium lightly pollinose,

subshining. Legs blackish, pulvilli infuscated. Wings clear, with but little trace of infuscation basad; veins blackish brown; halteres light yellow.

Head with eyes separated by a distance slightly less than breadth of third antennal segment; frontal vitta reduced to lineal dimensions caudad, perceptibly separating the parafrontals; parafrontal bristles well developed, continued in series caudad to a level approaching that at narrowest distance between the eyes; parafacials at base of antennæ slightly narrower than breadth of third antennal segment, considerably restricted ventrad; cheeks broad, well maintained caudad, in height fully equal to breadth of third antennal segment; arista short pubescent, the basal hairs about as long as diameter of arista at base.

Thorax with presutural acrosticals setulose, with three pairs of post-sutural dorsocentral bristles; scutellum with fine hairs on dorsal margin of lateral declivities adjacent the apical bristles; sternopleural bristles arranged, 1: 1.

Abdomen cylindrico-conical, viewed from above and behind terga three and four with markings restricted to dorsum, on the former segment the marks are subquadrate, on the latter subtriangular, smaller, and more widely spaced apart; tergum five with small, more or less obscure marks caudad; sterna three and four with a series of fine bristles along lateral margins; sternum five with fine setulæ and a few fine bristles at apex of processes, the inner margin with a small polished tubercular process at apex.

Fore tibia with no median posterior bristle: mid femur with a series of longish setulæ along anteroventral surface, with a series of bristles on proximal half of posteroventral surface; mid tibia with 2 posterior bristles: hind femur with 4 bristles on distal half of anteroventral surface, posteroventral surface with no bristles; hind tibia with 1 or 2 anteroventral, and 2 anterodorsal bristles, and weaker bristles on posterior surface not evident.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin; *m-cu* cross vein oblique.

FEMALE, paler than male; parafrontals, parafacials, and cheeks grayish pruinulent, the parafrontals largely brownish pruinulent; frontal triangle brownish pollinose; proboscis pollinose. Thorax viewed from above and in front densely grayish pruinulent, with brownish dorsocentral vitta; macrochaetae set in brownish spots; scutellum entirely grayish. Abdomen densely grayish pruinulent with paired brownish marks on terga 1+2, three, and four; tergum five with brownish dorsocentral vitta. Legs blackish, the coxæ and femora densely grayish pollinose. Wings clear, veins yellowish brown; calyptre whitish. Halteres light yellow.

Parafrontals with a few setulæ; parafacials at base of antennæ about as wide as breadth of third antennal segment; cheeks in height fully as wide as breadth of third antennal segment. Thorax with sternopleural bristles arranged, 1: 2, the ventral bristle of caudal pair short and much weaker developed than dorsal bristle. Abdomen with paired subtriangular

marks on terga 1+2, three, and four; ovipositor with setulose hairs on anal plates.

Fore tibia with no median posterior bristle: mid femur with only a bristle at base of ventral surface; mid tibia with 2 or 3 posterior bristles: hind femur with 3 or 4 bristles on distal half of anteroventral surface; hind tibia with 1 anteroventral, and 2 anterodorsal bristles, and with 1 weaker posterior bristle.

Wings with costal thorns strongly developed; veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin; *m-cu* cross vein sinuate.

Length, 5 mm.

RECORD:—

1 ♂, Bozeman, Montana, June 14, 1916; 1 ♂, June 15, 1916;  
1 ♀, June 30, 1916. (Mont. Exp. Station)

Type and allotype in United States National Museum.

The male of this species closely resembles that of *baltica*, differing essentially in that the abdomen is more densely cinerous gray pollinose, and the hind femur has no series of bristles on proximal half of anteroventral and posteroventral surfaces.

***Limnophora (Spilogona) parvimaclata* Stein**

*Limnophora parvimaclata* Stein, Arch. f. Naturgesch., 1920  
(1918) May Abt. A Heft 9 pp. 47. 50.

*Limnophora clivicola* Malloch, Trans. Amer. Ent. Soc., 1920  
June XLVI No. 802 p. 155.

*Melanocheilia clivicola* Malloch, Canad. Ent., 1921 LIII p. 64.

*Spilogona clivicola* Johnson, Occ. Pap. Boston Soc. Nat. Hist.,  
No. VII, 1925 p. 229.

*Spilogona parvimaclata* Hockett, Mem. 101 N. Y. (Cornell)  
Agric. Exp. Station, 1928 (1926) p. 834.

RECORDS:—

Ontario, 1 ♂, Ottawa, July 31, 1924; 1 ♀, Lyn, July 7, 1926.  
(C. H. Curran)

New York, 1 ♂, Buttermilk, Ithaca, July 14, 1920; 3 ♀, Sept.  
25, 1920; 6 ♀, July 18, 1920; 2 ♀, Ithaca, June 30, 1913.

Illinois, 1 ♂, Alto Pass, June 5-6, 1919.

I feel confident that *clivicola* Malloch and *parvimaclata* Stein are the same species, having seen topotypical specimens of this striking species from Illinois and New York. The type and allotype of *clivicola* are in the collection of the Illinois Natural



History Survey at Urbana. The male type has the hind tibiae slightly brownish.

Typically the eyes in the male are very large, restricting the frons to lineal dimensions. In addition the parafrontals, parafacials, and cheeks are very narrow when viewed in profile. The parafrontal bristles are strong and erect, continuing in series caudad to a level with frontal triangle. The abdomen is densely yellowish gray pollinose with the marks more or less perceptible beneath the pruinosity as dark reflections. In rubbed specimens the marks become more distinct. In the male specimen from Ottawa the characteristic appearance of the head is not so marked, the eyes being smaller with the result that the frons, parafacials, and cheeks are relatively broad, and in addition the abdominal marks are more apparent.

In the female the thorax and abdomen are grayish in color, the former with three brownish vittæ, and the latter with restricted brownish marks. Also the scutellum is entirely grayish, the mid femur has at most only one or two short bristles at base of posteroventral surface, and the wings are clear, hyaline.

#### ***Limnophora (Spilogona) nitidifrons* Stein**

*Limnophora nitidifrons* Stein, Arch. f. Naturgesch., 1920 (1918)  
Abt. A Heft 9 p. 50.

This species was described by Stein from three females collected by Dr. Aldrich on Mount Rainier, Washington, August 7, 1905.

I am reluctant to believe that the species is valid owing to the fact that there are at least two females of other species recorded from this region that fit the description, namely, *Sphenomyia biguadrata* (Walker), and *Spilogona aerea* (Zetterstedt), and possibly *Spilogona concolor* (Stein) and *S. leucogaster* (Zetterstedt).

It is significant that Stein (60) on page fifty-six in the same article listed males of *leucogaster* as collected by Dr. Aldrich on Mount Rainier, Washington, on August 2, 1905. The males of *Sphenomyia biguadrata* are very similar to those of *leucogaster* except that in the former species vein *R.* 4 + 5 has a few setulæ toward base, and the halteres are more yellowish. The descrip-

tion of *nitidifrons* fits the females of *biquadrata* exactly, but as Stein makes no mention of vein *R.* 4 + 5 one is led to infer that it possessed no characters of specific importance. Only an examination of the type will make possible the identity of the species.

#### ADDITIONAL RECORDS

Since this paper has been prepared for publication Mr. Collin (6a) has recorded in his study of the Greenland species of *Limnophora* a number of additional forms. Some of these have been included in the present study of North American species, the remainder I have listed below.

*Pseudolimnophora rotundata* Collin

*Limnophora sinuata* Collin

*Spilogona alpica* Zetterstedt (= *latifrons* Stein)

*Spilogona arctica* Zetterstedt (= *fumipennis* Zetterstedt)

*Spilogona deflorata* Holmgren

*Spilogona macropyga* Frey

*Spilogona latilamina* Collin

*Spilogona micans* Ringdahl

*Spilogona malaisei* Ringdahl

*Spilogona opaca* Schnabl (= *freyi* Ringdahl)

*Spilogona tornensis* Ringdahl (= *seticosta* Ringdahl not Schnabl)

*Spilogona trigonifera* Zetterstedt

*Spilogona freyi* Ringdahl (Collin, 6b)

The following species are recorded as occurring in North America, but since I have not been able to recognize any of them I am unable to do more than list their names and records.

*Aricia contractifrons* Zetterstedt, Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 166. North America

*Limnophora litorea* (Fallen), Slosson, Ent. News, 1895 VI p. 320. (determined by Coquillet) New Hampshire: Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 47. 56. British Columbia

*Limnophora nupta* (Zetterstedt), Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 48. 58. Idaho, Washington

*Melanocheilia spinicosta* Malloch, Proc. Cal. Acad. Sci., 1921 ser. 4 p. 181. Alaska

*Melanocheilia immaculiventris* Malloch, Proc. Cal. Acad. Sci., 1923 ser. 4 XII No. 21 p. 425. Gulf of California.

The following species, in my opinion, belong to other genera.

*Limnophora refusa* (Giglio-Tos) Slosson, Ent. News, 1896 VII p. 263, (determined by Coquillett). New Hampshire.

*Limnophora stygia* (Meigen) Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 548. North America

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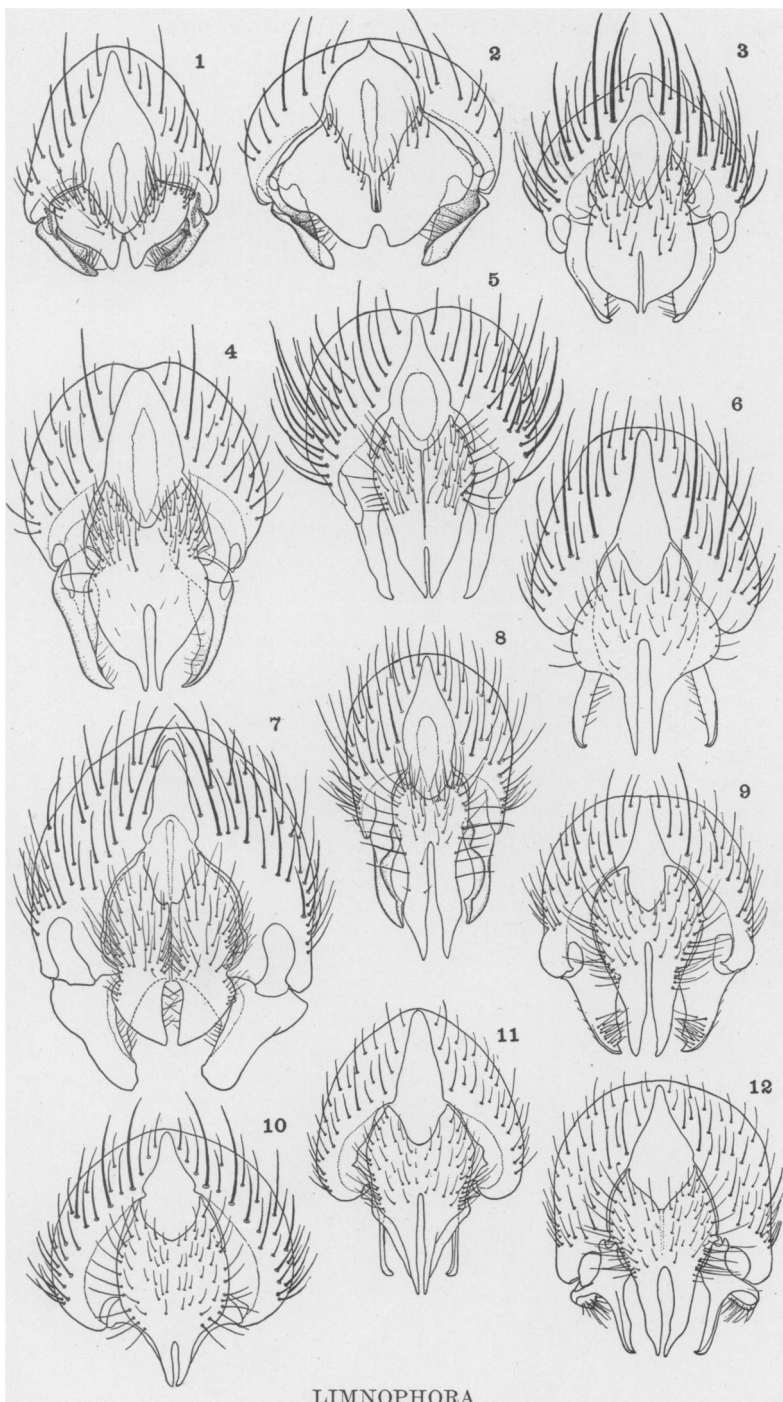
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## PLATE VII

## Dorsal or caudal aspect of male copulatory appendages

- Figure 1. (*Limnophora*) *narona* (Walker)
- Figure 2. (*Limnophora*) *discreta* Stein
- Figure 3. (*Spilogona*) *narina* (Walker)
- Figure 4. (*Spilogona*) *subrostrata* Stein
- Figure 5. (*Spilogona*) *novæ-angliæ* Malloch
- Figure 6. (*Spilogona*) *sospita* new species
- Figure 7. (*Spilogona*) *fatima* new species
- Figure 8. (*Spilogona*) *tetrachæta* Malloch
- Figure 9. (*Spilogona*) *concolor* Stein
- Figure 10. (*Spilogona*) *obscuripennis* Stein
- Figure 11. (*Spilogona*) *addicta* new species
- Figure 12. (*Spilogona*) *ærea* (Zetterstedt)



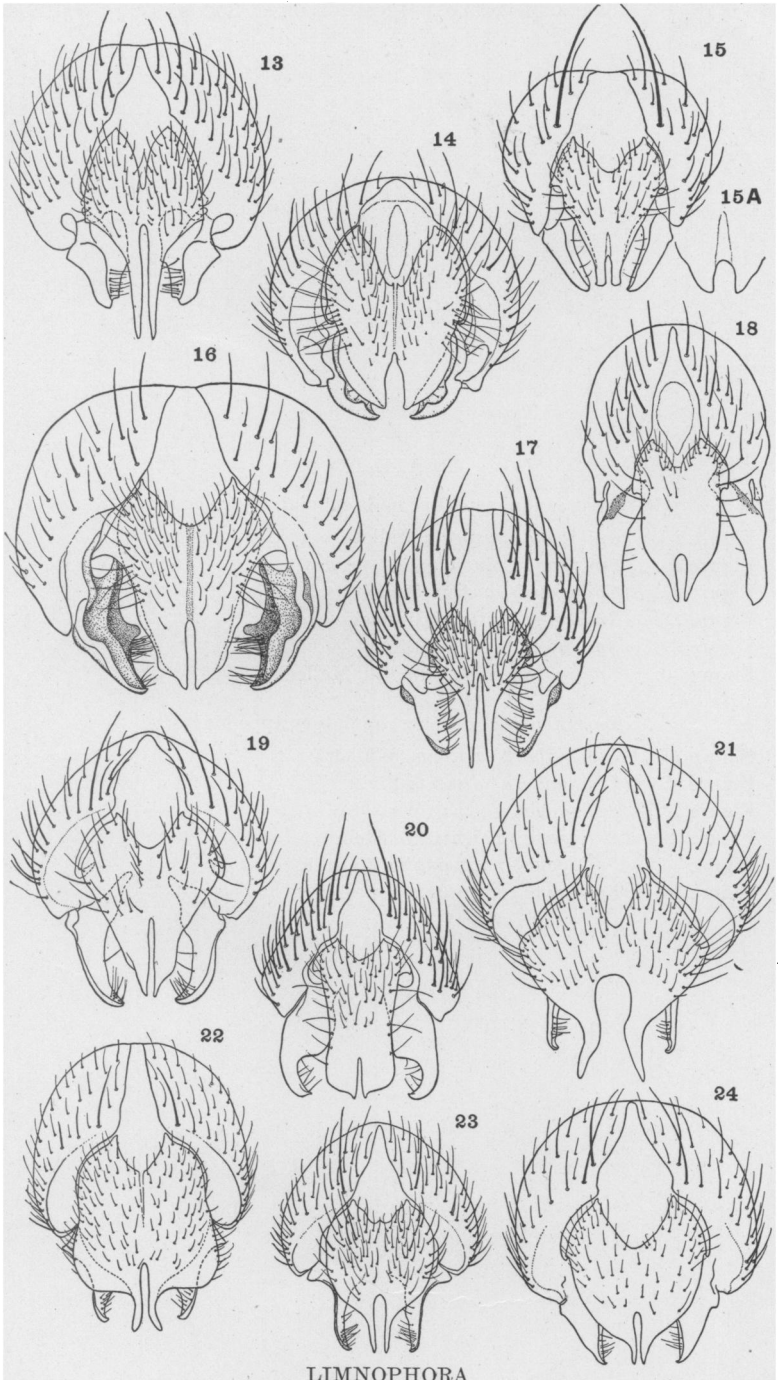


LIMNOPHORA

## PLATE VIII

## Dorsal or caudal aspect of male copulatory appendages

- Figure 13. (*Spilogona pulvicrura* new species  
Figure 14. (*Spilogona nobilis* Stein  
Figure 15. (*Spilogona argentiventris* Malloch  
Figure 15a. (*Spilogona argentiventris occidentalis* new variety  
Figure 16. (*Spilogona ruftarsis* Stein  
Figure 17. (*Spilogona alliterata* new species  
Figure 18. (*Spilogona fuscomarginata* new species  
Figure 19. (*Spilogona torreyae* Johannsen  
Figure 20. (*Spilogona crassiventris* new species  
Figure 21. (*Spilogona acuticornis* Malloch  
Figure 22. (*Spilogona surda* (Zetterstedt)  
Figure 23. (*Spilogona bisetosa* new species  
Figure 24. (*Spilogona ruftibia* Stein



LIMNOPHORA

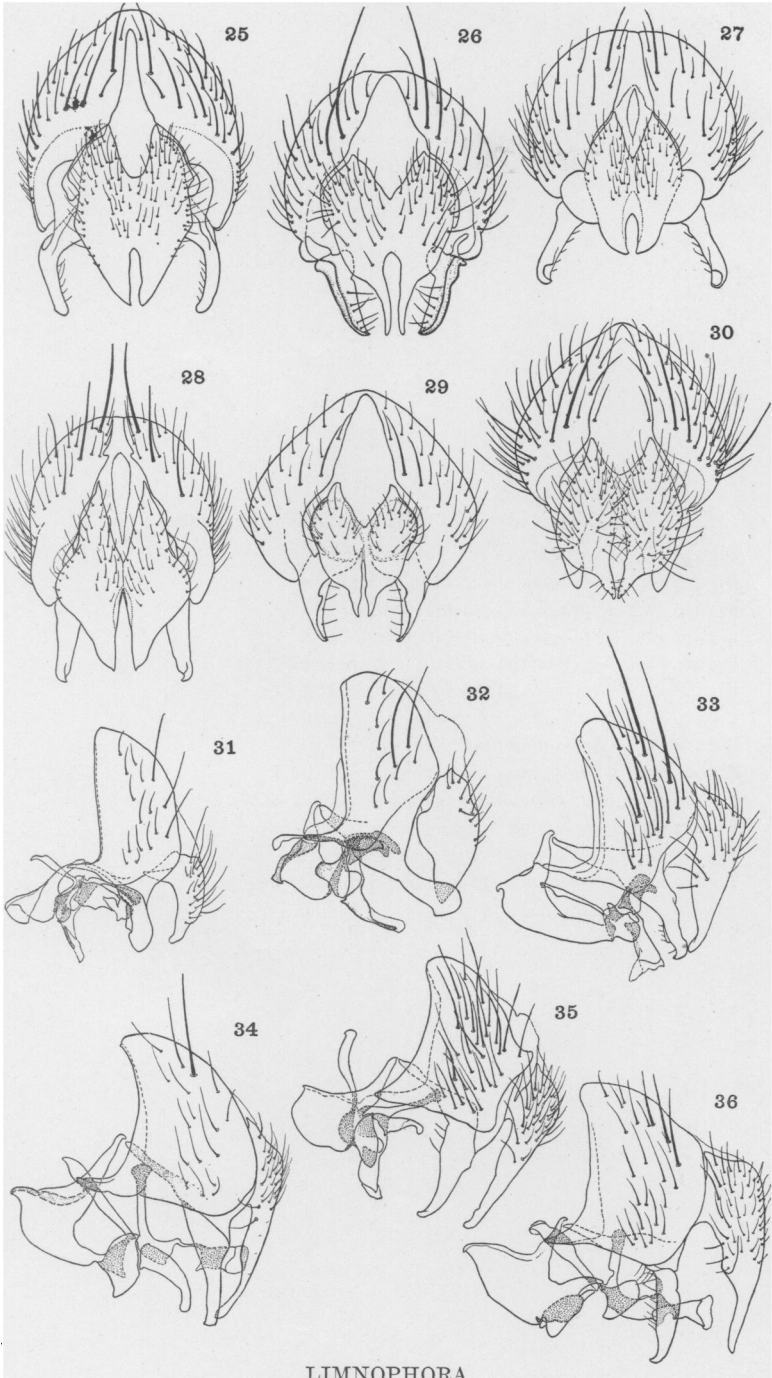
## PLATE IX

## Dorsal or caudal aspect of male copulatory appendages

- Figure 25. (*Spilogona*) *suspecta* Malloch  
Figure 26. (*Spilogona*) *pluvialis* new species  
Figure 27. (*Spilogona*) *contractifrons fumipennis* (Zetterstedt)  
Figure 28. (*Spilogona*) *alticola* Malloch  
Figure 29. (*Spilogona*) *anthrax* Bigot  
Figure 30. (*Spilogona*) *magnipunctata* Malloch

## Lateral aspect of male copulatory appendages

- Figure 31. (*Limnophora*) *narona* (Walker)  
Figure 32. (*Limnophora*) *discreta* Stein  
Figure 33. (*Spilogona*) *narina* (Walker)  
Figure 34. (*Spilogona*) *subrostrata* Stein  
Figure 35. (*Spilogona*) *novæ-angliæ* Malloch  
Figure 36. (*Spilogona*) *sospita* new species

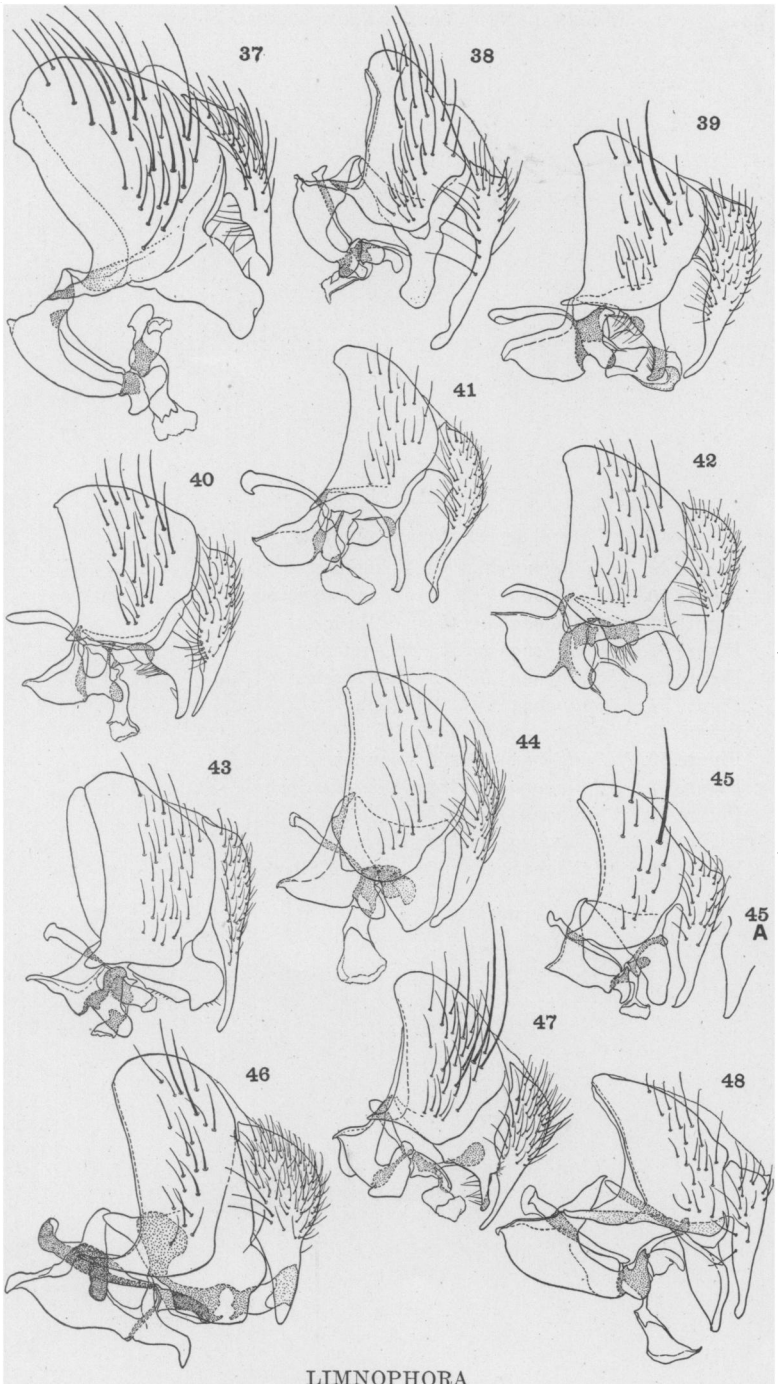


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## PLATE X

## Lateral aspect of male copulatory appendages

- Figure 37. (*Spilogona*) *fatima* new species  
Figure 38. (*Spilogona*) *tetrachæta* Malloch  
Figure 39. (*Spilogona*) *concolor* Stein  
Figure 40. (*Spilogona*) *obscuripennis* Stein  
Figure 41. (*Spilogona*) *addicta* new species  
Figure 42. (*Spilogona*) *ærea* (Zetterstedt)  
Figure 43. (*Spilogona*) *pulvicura* new species  
Figure 44. (*Spilogona*) *nobilis* Stein  
Figure 45. (*Spilogona*) *argentiventris* Malloch  
Figure 45a. (*Spilogona*) *argentiventris occidentalis* new variety  
Figure 46. (*Spilogona*) *ruftarsis* Stein  
Figure 47. (*Spilogona*) *alliterata* new species  
Figure 48. (*Spilogona*) *fuscomarginata* new species



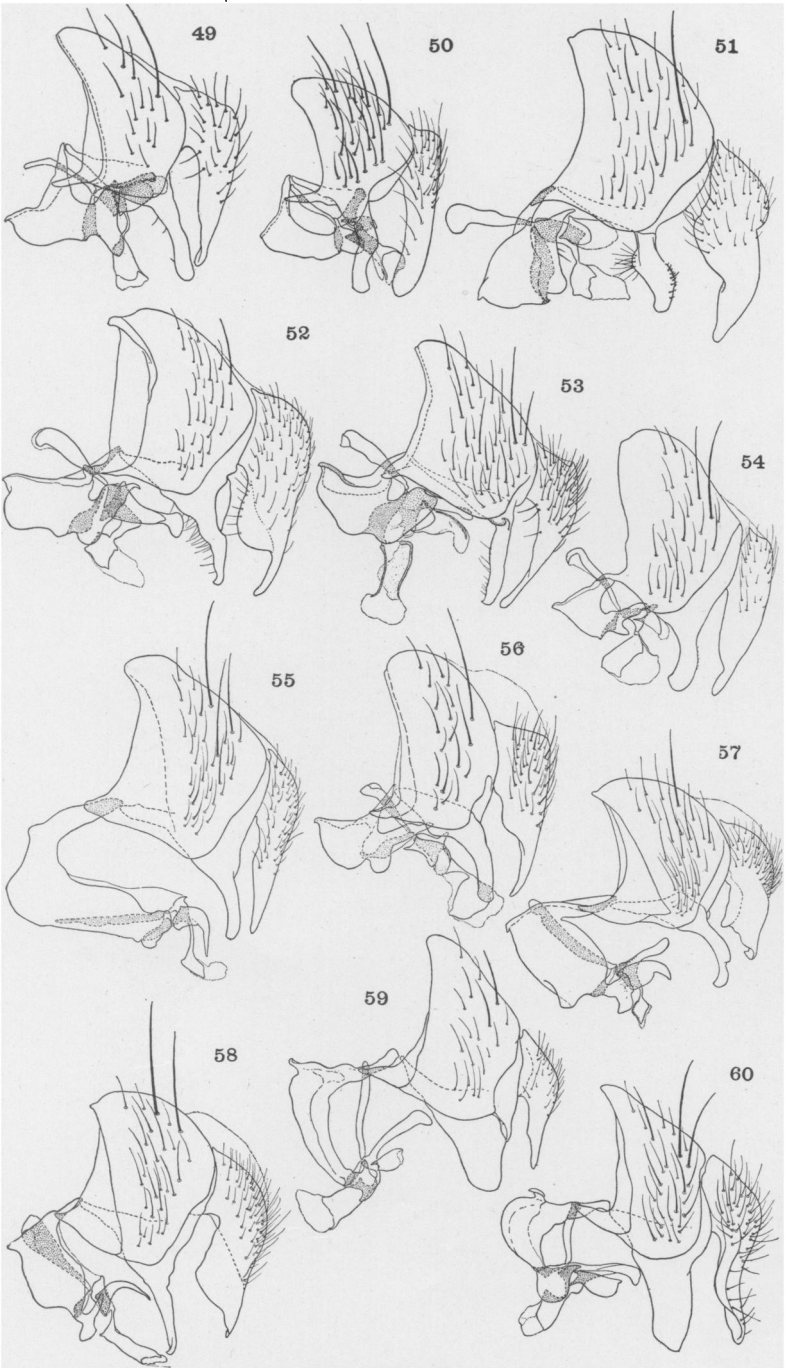
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## PLATE XI

## Lateral aspect of male copulatory appendages

- Figure 49. (*Spilogona*) *torreyæ* Johannsen  
Figure 50. (*Spilogona*) *crassiventris* new species  
Figure 51. (*Spilogona*) *acuticornis* Malloch  
Figure 52. (*Spilogona*) *surda* (Zetterstedt)  
Figure 53. (*Spilogona*) *bisetosa* new species  
Figure 54. (*Spilogona*) *ruftibia* Stein  
Figure 55. (*Spilogona*) *suspecta* Malloch  
Figure 56. (*Spilogona*) *pluvialis* new species  
Figure 57. (*Spilogona*) *contractifrons fumipennis* (Zetterstedt)  
Figure 58. (*Spilogona*) *alticola* Malloch  
Figure 59. (*Spilogona*) *anthrax* Bigot  
Figure 60. (*Spilogona*) *magnipunctata* Malloch



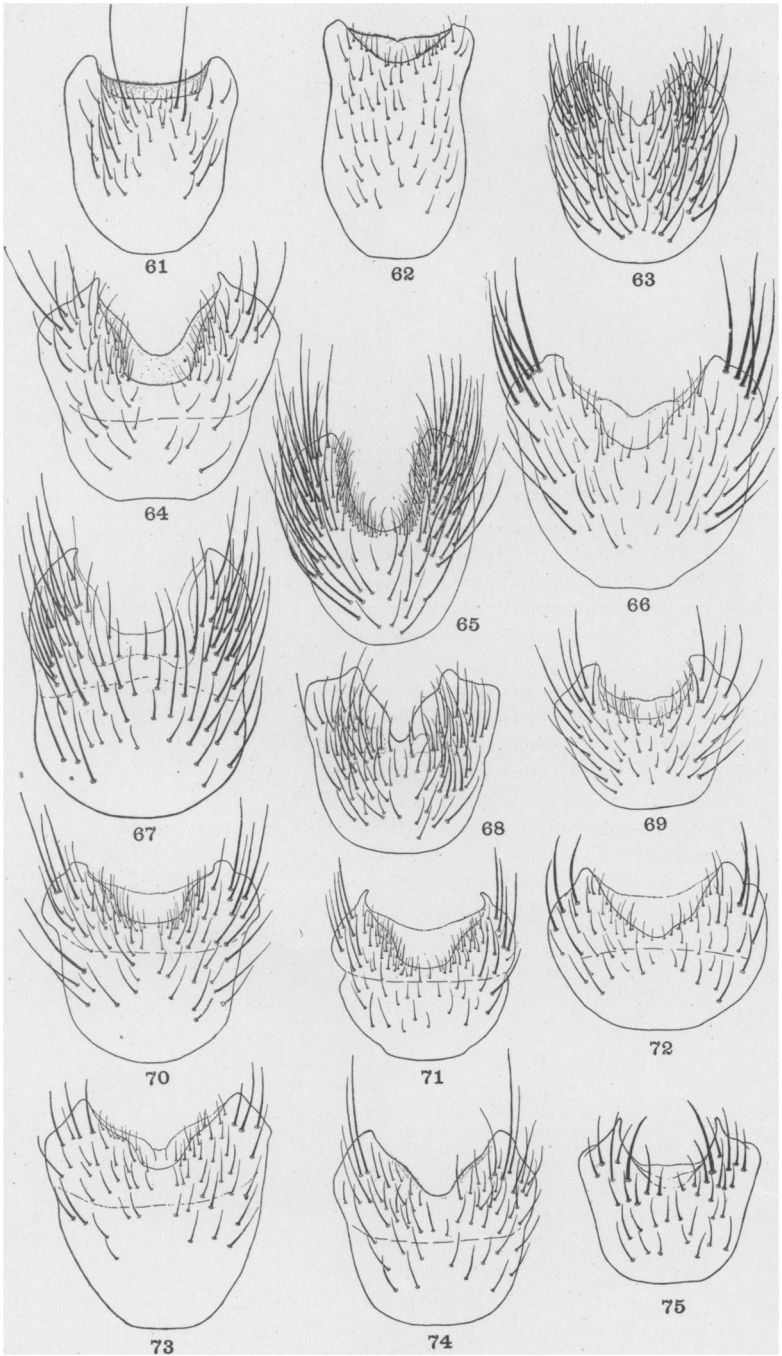


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## PLATE XII

## Ventral aspect of sternum five in male

- Figure 61. (*Limnophora narona* (Walker)  
Figure 62. (*Limnophora discreta* Stein  
Figure 63. (*Spilogona narina* (Walker)  
Figure 64. (*Spilogona subrostrata* Stein  
Figure 65. (*Spilogona novæ-angliæ* Malloch  
Figure 66. (*Spilogona sospita* new species  
Figure 67. (*Spilogona fatima* new species  
Figure 68. (*Spilogona tetrachæta* Malloch  
Figure 69. (*Spilogona concolor* Stein  
Figure 70. (*Spilogona obscuripennis* Stein  
Figure 71. (*Spilogona addicta* new species  
Figure 72. (*Spilogona ærea* (Zetterstedt)  
Figure 73. (*Spilogona pulvicrura* new species  
Figure 74. (*Spilogona nobilis* Stein  
Figure 75. (*Spilogona argentiventris* Malloch

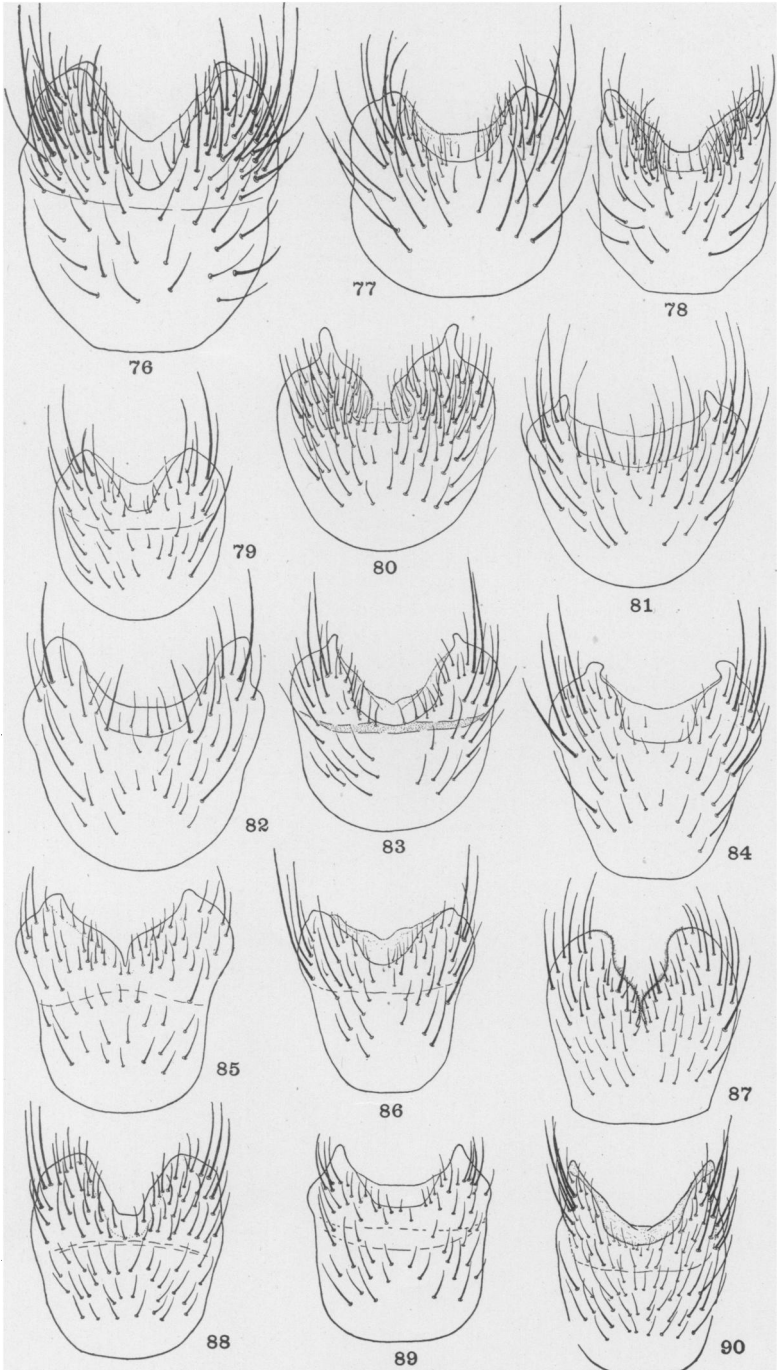


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## PLATE XIII

## Ventral aspect of sternum five in male

- Figure 76. (*Spilogona*) *rufitarsis* Stein  
Figure 77. (*Spilogona*) *alliterata* new species  
Figure 78. (*Spilogona*) *fuscomarginata* new species  
Figure 79. (*Spilogona*) *torreyæ* Johannsen  
Figure 80. (*Spilogona*) *crassiventris* new species  
Figure 81. (*Spilogona*) *acuticornis* Malloch  
Figure 82. (*Spilogona*) *surda* (Zetterstedt)  
Figure 83. (*Spilogona*) *bisetosa* new species  
Figure 84. (*Spilogona*) *rufitibia* Stein  
Figure 85. (*Spilogona*) *suspecta* Malloch  
Figure 86. (*Spilogona*) *pluvialis* new species  
Figure 87. (*Spilogona*) *contractifrons fumipennis* (Zetterstedt)  
Figure 88. (*Spilogona*) *alticola* Malloch  
Figure 89. (*Spilogona*) *anthrax* Bigot  
Figure 90. (*Spilogona*) *magnipunctata* Malloch



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