

KEY TO THE NEARCTIC SPECIES OF THE GENUS LAPHRIA (DIPTERA, ASILIDÆ).

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Working up material for a list of the Asilidæ of the District of Columbia region necessitated the present revision. The fact that it is necessary to describe as new, five species from this area, of a single genus of flies of as large average size as the Asilidæ, would indicate that there is still plenty of work for entomologists in the most frequented collecting grounds. Mr. Nathan Banks who is collaborating on the Asilid list has found it necessary to describe also one species each of *Leptogaster*, *Dioctria*, *Dasyllis* and *Asilus* from local collections.

In determining the status of our three described and five undescribed species of *Laphria*, it became desirable to see as much material as possible. For generous loans of specimens and other help the writer is indebted to Messrs. C. P. Alexander, Nathan Banks, W. S. Fisher, C. T. Greene, J. S. Hine, F. Knab, J. R. Malloch, and W. R. Walton. Professor J. M. Aldrich kindly furnished valuable bibliographic references. Of the species of *Laphria* listed by Aldrich,* *amanda* Walker (which appears to be a *Nusa*), *coerulea* Williston (now *willistoniana* Enderlein), *componens* Walker, *homopoda* Bellardi, *ichneumon* Osten Sacken, *marginalis* Williston, *numitor* Osten Sacken, *olbus* Walker, *ruficauda* Williston, and *triligata* Walker, so far as known, are entirely neotropical in distribution.

In the same list—a collection of 35 names in all—the following cases of synonymy occur: *bilineata* Walker = *gilva* Linnaeus; *pubescens* Williston = *sadales* Walker; and *xanthippe* Williston = (*Lampria*) *felis* Osten Sacken. The list may be further reduced by the elimination of one preoccupied name, *anthrax* Williston, not Meigen = *carbonarius* Snow.

* Aldrich, J. M., A Catalogue of North American Diptera, Smiths. Misc. Coll. Vol. 46, 1905, pp. 272-3.

In the purview of the present paper the following names remain unidentified: *aeatus* Walker (see discussion under *aimatis* n. sp. further on), *carolinensis* Schiner, *flavescens* Macquart, *flavipila* Macquart, *georgina* Wiedemann, *lasipes* Wiedemann, *melanogaster* Wiedemann (all black species have been disregarded, because only females have been seen) and *terrae-novae* Macquart. Excepting *aeatus*, *lasipes* and *melanogaster*, these species would appear to be of the *Dasyllis* type. After all eliminations (and two additions) there are considered in the present discussion the following previously named species of *Laphria*: *canis* Williston, *carbonarius* Snow, *disparella* Banks, *felis* Osten Sacken, *ferox* Williston, *franciscana* Bigot, *gilva* Linnaeus, *rapax* Osten Sacken, *sadales* Walker, *saffrana* Fabricius, *sericea* Say, *ventralis* Williston, *vivax* Williston and *vultur* Osten Sacken. Ten new species are described, viz.: *aimatis aktis*, *coquilleltii*, *index*, *ithypyga*, *janus*, *sicula*, *scorpio*, *trux*, and *winnemana*.

Arrangement of the species of *Laphria* to indicate relationships is attended with the difficulty usual to such endeavors. The linear series to which we are reduced by the limitations of printed pages, is unsatisfactory. A sphere is a better figure to accommodate our conception of the origin and relationships of the members of any evolutionary group. The hypothetical ancestry is at the center, while descendants occupy positions in various directions and at varying distances from the center according to the line of their specialization and the degree of their departure from the type. Closely related forms may be ranged side by side, but relationships of any degree between forms wherever located may be indicated by the lines which conceivably may connect any points in such a figure.

Though it would be possible to construct a model embodying a conception of this nature, and even to reproduce it in a fairly satisfactory way by photography, as a rule such a concept will be mental only. Since practical considerations demand a linear arrangement, one for the species of *Laphria* examined by the writer is submitted, though not without misgivings. While other features have been given some consideration, the characters of the male hypopygium have had preponderant weight in governing the arrangement. Increasing use of genital characters is a conspicuous tendency of modern taxonomic entomol-

ogy, nevertheless it must be admitted that the significance of these characters is not thoroughly understood. Sexual polymorphism is well known in the Lepidoptera. In another group of Arthropoda, the Crustacea, and particularly in crawfishes, the same phenomenon occurs, and in this case differences in type extend to the male genitalia.

We do not know whether comprehensive life-history investigations, especially rearing prolonged to several generations, will vitiate some of the classification based on genital characters, but until such researches have been made we can only proceed upon the basis of observed differences. Meanwhile confidence in the method is inspired by discovery of correlations of other characters with those of the genitalia, and especially by the disclosure among specimens sorted on the basis of genital structure, of previously unnoticed differences in other significant details.

For the sake of ease of observation only the external structure of the male hypopygia has been used in the present study. When it is necessary to refine the classification of the nearctic *Laphria*, undoubtedly additional useful characters may be found in the hooks, claspers and other more hidden details of the genitalia.*

The present revision comprises 23 species of which 10 are described as new and 9 varieties of which 5 are here first characterized. On the basis of this experience the writer would expect new forms among every considerable collection of flies on the genus *Laphria*.

In the following arrangement, groups of species are separated by spaces; looseness of relationship within groups is indicated by bracketing individually the comparatively less related species, and closer kinship by bracketing in pairs the nearer relatives.

* The terminology employed for the parts of the hypopygia is that learned by the writer in the study of homoptera, especially the Psyllidæ. That portion of the hypopygium bearing the forceps is the genital valve; the opposed portion, the anal valve. For details of these structures see an article by R. E. Snodgrass, entitled "The inverted hypopygium of *Dasyllis* and *Laphria*." (*Psyche*, 9, Oct., 1902, pp. 399-400, Pl. 5). It may be said the "inversion" in *Laphria* is of rather fortuitous occurrence. Recently emerged specimens have the hypopygium in normal position, with genital valve opposed to lower surface of abdomen, as seen in *Dolichopodidæ*, etc. All degrees of rotation of the hypopygium occur, and apparently, copulation, ending in a tail to tail position of the flies, has much to do with the inversion.

vultur
 { sericea
 { aktis
 janus
 ferox
 { gilva
 { vivax
 { ventralis
 { coquilletti
 trux
 aimatis
 sadales
 felis
 scorpio
 index
 ithypyga
 { sicala
 { franciscana
 { canis
 { winnemana
 saffrana

So far as specialization of the hypopygium goes, an extreme degree in certain directions is exemplified by *vultur*, by *ferox*, *gilva*, *scorpio* and *canis*. Yet these species are not related to each other and cannot be placed together at the apex of an evolutionary series. Evolution is a matter of radiation, and in a linear series this fact forces a wave conception, proceeding from a low degree of specialization along a certain line to its culmination, dropping to the low point of a different line, and so on.

In the foregoing arrangement *sadales* and *felis* occupy the high point with reference to length of third antennal joint, it being nearly three times length of basal joint; in all the other species it is almost exactly twice that length. This is a character possessed by some species of *Lampria*, and if *Lampria* were incorporated into the genus *Laphria* this would be its position—among species which agree in every essential except in possession of spinose hind femora.

This latter character exists in varying degree and probably there is a complete intergradation between the genera in this respect. In some specimens of *Lampria rubriventris*, the tubercles are evanescent. However, the genus *Laphria* is so large (more than 300 described species) that it is not desirable to merge with it separable groups even if absolutely trenchant characters are not available.

The same argument applies in the case of the species grouped under *Dasyllis*. Professor M. Bezzi has pointed out* the lack of definitely separating characters between *Dasyllis* and *Laphria*, but it must be admitted that *Dasyllis* has a typical general appearance different from most species of *Laphria*, and that the male genitalia are of a different type (see Figs. 24 and 25). According to the opinion of Col. J. E. Yerbury, cited by Dr. S. W. Williston,† there is but one species of *Dasyllis*, the type species, *Laphria haemorrhoea* Wiedemann. Not having seen this species, I am unable to comment on the case.

Nusa should be regarded as a genus distinct from *Laphria*, not on the usually cited character of decided narrowing or closure of the first posterior cell, which is illusory, but on the grounds of a distinct type of genitalia (in which body of the forceps is simple, but one or both sets of claspers are exposed, taking the position of the apex of the forceps in *Laphria*, (see Fig. 26), and upon habitus, an important feature of which is the full set of thoracic markings, including three pairs of lateral lunules. Many of the species have also swollen femora and curved tibiae.

KEY TO THE MALES OF NEARCTIC SPECIES OF LAPHRIA BASED CHIEFLY ON CHARACTERS OF THE GENITALIA.

- a. Forceps comparatively slender, nearly straight when viewed from above (except in *aktis*, Fig. 3), with a falcate process forming part of outer lateral surface.
- b. Forceps somewhat spatulate, and nearly straight when viewed from above.
- c. Falcate process rather broad and blunt (Fig. 4); pale (golden) pubescence most conspicuous on posterior half of thoracic dorsum.... *janus* n. sp.
- cc. Falcate process more slender and acute.
- d. Forceps, viewed from side, decurved at tip (Fig. 1); general pubescence reddish tawny..... *vultur* OS.
- dd. Forceps not decurved at tip (Fig. 2); general pubescence golden.... *sericea* Say
- bb. Forceps not spatulate, curved when viewed from above; falcate process very slender and acute (Figs. 3, 3a); general pubescence golden.... *aktis* n. sp.

* Zeitschr. f. syst. Hym. u. Dipt. VII, 2, March 1, 1908, pp. 108-110.

† Manual of North American Diptera. Third Ed. 1908, p. 389.

- aa. Forceps stouter, and more or less curved when viewed from above (except in *saffrana*, Fig. 23), without lateral falcate process.
 - e. Each forceps bearing on median upper surface a lamellate process apparently formed of coalescent bristles.
 - f. This process very long, fimbriate and brush-like, unaccompanied by a smaller inner apical process (Fig. 5); dark species with golden pile on face and posterior margins of abdominal segments. *ferox* Will.
 - ff. Median process less brush-like, and accompanied by a smaller one of more or less similar structure on apical part of inner margin of forceps.
 - g. The two processes almost contiguous at base, both well-elevated distally above surface of forceps, main process about as broad apically as elsewhere (Fig. 6); abdominal segments 4-6 in part ferruginous with concolorous pile. *gilva* L.
 - gg. The two processes more remote at base; the smaller rather closely paralleling surface of forceps.
 - h. Main process as broad or broader at tip than elsewhere.
 - i. Median lamella less solidified; inner process not extending beyond end of forceps (Fig. 7); pale pile, light yellowish green to pale golden, not forming distinct bands clear across hind margins of abdominal segments. *vivax* Will.
 - ii. Median lamella more solidified; inner process extending slightly beyond end of forceps (Fig. 8); pale pile, golden to red gold in color, forming conspicuous bands across hind margins of segments. *vivax anthemon* n. subsp.
 - hh. Main process narrowed apically (Figs. 9, 10); yellow pile on posterior half of pronotum.
 - j. Segments 3-7 with hind angles and margins ferruginous with golden pile. *ventralis* Will.
 - jj Segments 3-7 entirely ferruginous with concolorous hair. *coquillettii* n. sp.
 - ee. Forceps without median lamellate process.
 - k. Each forceps with a more or less distinctly separate process on apical part of inner margin.
 - l. Process rather closely paralleling body of forceps.
 - m. Process, as seen from side, clearly though sometimes only slightly separated from body of forceps.
 - n. Larger species with dense ferruginous pile on abdomen.
 - o. Apical process of forceps distinctly curved, somewhat twisted longitudinally, and rather abruptly narrowed near tip (Fig. 11); species with whitish hair on posterior half of pronotum; segments 3-7 with dense golden to orange red hair.
 - p. Length over 25 mm.; abdominal pile orange red. *trux* n. sp.
 - pp. Length under 20 mm.; abdominal pile golden. *trux* var. *audax* n. var.
 - oo. Apical process of forceps neither curved nor twisted (Fig. 12); segments 3-7 in part ferruginous with concolorous pile. *aimatis* n. sp.
 - nn. Smaller species; abdomen nearly bare or with only a moderate proportion of dense (usually golden) pubescence.
 - q. Forceps as in Figure 13; blackish species, with legs, except tarsi, reddish yellow. *sadales* walk.
 - qq. Apical process of forceps a little longer, more pointed and farther recurrent along inner margin of forceps (Fig. 14); abdominal segments 2 or 3 to 7 yellow to reddish. (For key to varieties see p. 162). *felis* OS.

- ll. Process not paralleling forceps, either almost touching apex of forceps or widely separate therefrom.
 - r. Process almost touching apex of forceps, distinctly longitudinally twisted; a deeply emarginate lobe on inner side of forceps at base of process (Fig. 16); facial pile silvery to yellow; no golden triangle on thorax; considerable golden pile on abdomen.....*scorpio* n. sp.
 - rr. Apical process not longitudinally twisted, well separated from body of forceps, the latter therefore appearing distinctly emarginate; species with narrow triangle of golden pile on thorax and golden pubescence on abdomen.
 - s. Process and apex of forceps appearing like an opposed index finger and thumb, the enclosed emargination, deep and narrowest distally; hypopygium more oblique (Fig. 17).....*index* n. sp.
 - ss. Emargination more shallow, widest distally, the apical process enlarged so that it has become main body of forceps; hypopygium straighter (Fig. 18).....*ithygyga* n. sp.
- k. Forceps without inner apical process.
 - t. Forceps concave along inner margin, without strong lobe at about middle of its length.
 - u. Forceps viewed from above, narrowed to apex.
 - v. Forceps rather acute, only slightly hollowed out beneath at apex. (Fig. 19).....*sicula* n. sp.
 - vv. Forceps less acute slightly upturned exteriorly at apex; much hollowed out beneath, with a thin, vertical plate along concave inner margin near apex. (Fig. 21).....*canis* Will.
 - uu. Forceps more or less clavate at apex; well hollowed out beneath.
 - w. Apex of forceps trapeziform (Fig. 22).....*winnemana* n. sp.
 - ww. Apex of forceps spoon-shaped (Fig. 20).....*franciscana* Bigot
 - tt. Forceps essentially straight, with a large inwardly and downwardly projecting lobe at about middle of its length (Fig. 23); species with disk of thorax black except for two central golden spots. *saffrana* Fabr.

KEY TO THE NEARCTIC SPECIES OF LAPHRIA BASED SO FAR AS PRACTICABLE UPON COLORATION.

- a. Disk of thoracic dorsum black except for a central pair of yellow spots; general color of pubescence old gold.....*saffrana* Fabr.
- aa. Coloration otherwise.
 - b. Integument of abdomen with yellow to ferruginous areas, bearing dense concolorous pubescence.

- c. Median parts of segments so colored.
- d. Segments 3 (or 2) to 7 in part ferruginous with concolorous hair....*aimatis* n. sp.
- dd. Segments 4-6 in part so colored.....*gilva* L.
- cc. Hind angles and margins or entire segments so colored.
 - e. Hind angles and margins of segments 3-7 yellow.....*ventralis* Will.
 - ee. All of segments 3-7 yellow; dense patch of yellow hair on posterior half of pronotum.....*coquilletti* n. sp.
- bb. Abdomen black in ground color, or if partly red, these areas not bearing dense concolorous hair.
 - f. First 3 segments strongly contrasting with others either in color of pile or integument.
 - g. First 3 segments black, others yellowish to reddish with sparse pubescence. (For key to varieties see page 162)....*felis* OS.
 - gg. Same coloration, but segments 4-7 with dense yellowish to reddish pile.
 - h. Patch of whitish pile on posterior half of pronotum....*trux* n. sp.
 - hh. Without such a patch.....*carbonarius* Snow
- ff. Color of first 3 segments not strongly contrasting with that of others.
 - i. Legs reddish, body black, nearly bare.....*sadales* Walk.
 - ii. Legs dark.
 - j. With copious bright golden to ardent rufous pile over whole dorsum of thorax and abdomen.
 - k. All hair of head including mystax reddish tawny, concolorous with that of remainder of body....*vultur* OS.
 - kk. Hair of head in part black.
 - l. Male genitalia as in Figure 3.....*aktis* n. sp.
 - ll. Male genitalia as in Figure 2.....*sericea* Say
 - jj. Pile of thoracic dorsum black, at least, at the sides in front.
 - n. Pale pile extending forward, at least to middle of pronotum, forming a distinct narrow triangle.
 - o. Male genitalia as in Figure 17.....*index* n. sp.
 - oo. Male genitalia as in Figure 18.....*ithypyga* n. sp.
 - nn. Pale pile not forming a distinct narrow triangle.
 - p. Pale pile covering at least posterior half of pronotum.....*janus* n. sp.
 - pp. Pale pile covering less than half of pronotum usually merely fringing posterior part.
 - q. Species with some dense yellowish to golden pile on abdomen.
 - r. Slender species.
 - s. Male genitalia as in Figure 16.....*scorpio* n. sp.
 - ss. Male genitalia as in Figure 21.....*canis* Will. var. *disparella* Banks.
 - rr. Robust species.
 - t. Tufts of hair in front of wings and halteres yellow.....*vivax* Will.
 - tt. Tufts of hair in front of wings and halteres black.....*ferox* Will.
 - qq. Species with no more than scattering yellow hairs on abdomen.
 - u. Male genitalia as in Figure 19.....*sicula* n. sp.
 - uu. Male genitalia as in Figure 20.....*franciscana* Bigot
 - uuu. Male genitalia as in Figure 21.....*canis* var. *canis* Will.
 - uuuu. Male genitalia as in Figure 22.....*winnemana* n. sp.

Laphria vultur Osten Sacken.

Laphria vultur, Osten Sacken, C. R. Western Diptera; descriptions of new genera and species of Diptera from the region west of the Mississippi and especially from California. Bul. U. S. Geol. and Geogr. Survey of the Territories, III, 1877, p. 286. (Woods of the Coast Range above Santa Cruz, Calif.; Webber Lake, Sierra Nevada.)

A large black* species with copious yellowish-red to reddish-orange hair; mystax and pleural hair lightest in color, that of abdomen most intense. Wings fumose, interior of cells more hyaline. Male forceps long, decurved near tip where there is a deflexed lobe on each side; falcate process long and rather acute. (Fig. 1). Length, 22-28 mm.

Localities represented: Kaslo, B. C., May 30, June 5, H. G. Dyar; July 15, R. P. Currie, (U. S. N. M.)†; Ainsworth, B. C., July 11, 1903, in cop., R. P. Currie, (U. S. N. M.); Bear Lake, B. C., July 21, 1903, J. W. Cockle, (U. S. N. M.); Fry Creek, B. C., July 23, 1903, in cop. H. G. Dyar, (U. S. N. M.); Victoria, B. C., July 17, 1901, (Hine); Goldstream, B. C., Aug. 10, 1902, (Hine); Washington, Kincaid, (Ill. State Lab.); Mt. Hood, Ore., H. K. Morrison, (U. S. N. M.); Yellowstone Park, June 26, 1907, W. Robinson (U. S. N. M.); North Cheyenne Canyon, El Paso Co., Colo., July 2, 1914, Champlain, (U. S. N. M.).

Laphria sericea Say.

Laphria sericea Say, Thomas. American Entomology, 1, 1824, pp. 12-13, Pl. 6, (United States). The Complete Writings of Thomas Say on the Entomology of North America. 1, 1859, pp. 12-13.

A black species with yellowish golden to ardent red gold hair on upper surface of thorax and abdomen. Beard, deflexed pile on face, hair on coxæ and lower pleural plates and tuft under root of wing whitish in female, tawny in male; bristles of mystax, tufts of hair on neck, vertex, and just below margin of thoracic dorsum, and sometimes short pile on anterior disk of thorax black. Hair of legs black, mixed with white, especially on posterior surfaces. Wings clear to blackish hyaline. Forceps of male genitalia, long, slender; deflexed lobes less prominent than in *vultur* and falcate process shorter. (Fig. 2). Length 16-25 mm.

A female specimen from White Mts., Vt., Geo. Dimmock (M. C. Z.) which is referred to here differs in having the thoracic dorsum clothed with pale yellowish pile.

* Unless otherwise stated, the ground color throughout of species described in this paper is black.

† Abbreviations following data indicate collections in which the specimens now are deposited. In full these collections are those of W. S. Fisher, J. S. Hine, Illinois State Laboratory of Natural History, Museum of Comparative Zoology, University of Kansas, United States Biological Survey, United States National Museum and W. R. Walton.

Other localities represented: Mt. Tom, Mass., July, Morrison, (U. S. N. M.); Ithaca, N. Y., July 25, 1893, June 15, 1895, (Hine); Medina, Ohio, June 12, 1899, (Hine); Vinton, Ohio, June 5-12, 1900, June 19-22, 1901, (Hine); Ira, Ohio, (Hine); Cincinnati, Ohio, May 30-31, 1910, (Hine); Algonquin, Ill., June 7, 13, 1895, (Ill. State Lab. Nat. Hist.); Inglenook, Pa., June 20, 1909, May 30, 1912, June 27, 1912, June 12, 1913, in cop., Champlain; June 26, Kirk; May 28, 1911, May 27, 1912, W. S. Fisher (Walton); Inglenook, Pa., June 14, 1913, June 14, 22, 1917, W. S. Fisher (Fisher); Harrisburg, Pa., July 5, 1908, W. R. Walton, (Walton); Enola, Pa., June 6, Kirk and Champlain, (Walton); Heckton Mills, Pa., June 15, 1909, W. R. Walton, (Walton); Perdix, Pa., May 27, 1911, W. S. Fisher, (Walton); Corry, Pa., W. R. Walton, (Walton); Rockville, Pa., July 8, 25, 1912, Champlain, (Walton); Cupid's Bower Id., Md., May 31, 1915, R. C. Shannon, (U. S. N. M.); Great Falls, Va., May 26, 1914, R. P. Currie, (U. S. N. M.); Great Falls, Va., June 16, 1910, R. A. Cushman, June 5, 1917, C. T. Greene, (U. S. N. M.); Scott's Run, Va., June 2, 1912, W. D. Appel (Biol. Survey); Dead Run, Va., June 9, 1915, R. C. Shannon, (U. S. N. M.), feeding on *Nicagus obscurus*; Falls Church, Va., June 12, 1916, J. N. Knull, (U. S. N. M.); Giles Co., Va., W. M. Davis, (U. S. N. M.); North Fork, Swannanoa River, Black Mt., N. C., May, N. Banks, (M. C. Z.); North Carolina, (U. S. N. M.); Florida, (U. S. N. M.).

***Laphria aktis* new species.**

In most respects a miniature of *L. sericea*. The beard and hair on coxæ are paler, however, even in the males. The forceps of the male genitalia are relatively shorter, distinctly curved and the falcate process is much longer, and very sharp pointed. (Figs. 3, 3a). Females are separable, if at all, on the basis of size. Length, 13-22 mm.

Type, male from Inglenook, Pa., June 27, 1912, Champlain (Walton).

Other specimens examined: Loudonville, Ohio, June 6, 1915, (Hine); Ira, Ohio, (Hine); Perdix, Pa., May 27, 1911, W. S. Fisher, (Walton); Heckton Mills, Pa., May 31, 1909, W. R. Walton, (Walton); Inglenook, Pa., May 30, 1912, Champlain, (Walton); June 14, 22, 1917, W. S. Fisher, (Fisher); Great Falls, Va., May 25, N. Banks, (M. C. Z.); North Carolina, (U. S. N. M.).

Laphria janus new species.

A species which appears to have the posterior half of thorax densely yellowish haired and the anterior half sparsely blackish. Under the microscope, however, when the insect is viewed from the front it is evident that much of the pile on anterior half of thorax is golden. It is nearly erect, however, so that in examining the insect from above one looks down between the hairs at the dark integument of the thorax. These erect hairs have black ones scattered among them. The pile on posterior half of thorax is longer and more recumbent and varies in color from pale yellow (sometimes almost white) to bright golden.

Beard, mystax, except for a few black hairs below, hair on coxæ, and pleuræ pale yellowish. Hair on abdomen semi-erect, sparse and pale yellow anteriorly, becoming more recumbent, dense and ferruginous posteriorly. Black hair on legs (accompanied by some pale ones, and the usual short, dense, rusty pile on inner side of front tibiæ and tarsi), vertex, occiput, neck tubercle, tuft in front of wing (sometimes yellow) fringe about thorax and sparsely on anterior half as above described.

Long yellowish to reddish hair on genitalia; anal valve moderately swollen; forceps, see Figure 4. Wings brownish hyaline; center of cells sometimes clear. Length, 15-20 mm.

This form is identified in some collections as *L. terræ-novæ* Macquart, but it does not closely agree with the description.* For instance, "underside of head with black hairs" and "abdomen with pale yellowish gray hairs" do not fit the present species. Even if the description of *terræ-novæ* were a much better fit, I should prefer to use a new name, since neither type nor homotype are available for comparison.

Western specimens differ slightly in general appearance from eastern ones, the color of hair on abdomen averaging more ardent and the tuft of hair in front of root of wing being more often wholly yellow.

Type specimen, male, and allotype, female, from near summit of Mt. Washington, New Hampshire, George Dimmock. In collection of U. S. National Museum.

Other specimens examined: Mt. Washington, N. H., George Dimmock, (U. S. N. M., M. C. Z.); June 29, 1874; H. K. Morrison, (U. S. N. M.); White Mts., N. H., George

* Macquart, J. *Dipteres exotiques, nouveaux ou peu connus*, 1, Part 2, 1838, pp. 69-70.

Dimmock, (M. C. Z.); Morrison, (U. S. N. M.); New Hampshire, Ottolengui, (U. S. N. M.); Maine, (U. S. N. M.); Isle Royale, Mich., July 26, 1905, (Hine); Dickinson County, Mich., July 6, 1909, Michigan Biological Survey, (Hine); Heyden, Ontario, July 31, 1906, E. B. Williamson, (Hine); Sault Ste. Marie, Ont., (Hine); Creede, Colo., Aug., 1914, 8844 feet elevation, S. J. Hunter, (Hine); Tolland, Colo., Aug. 15-16, 1917, E. C. Jackson, (Biol. Survey); Washington, Brodie, (U. S. N. M.); Kaslo, B. C., June 12, 18, R. P. Currie, July 11, 1903, A. N. Caudell, (U. S. N. M.).

There is considerable resemblance between the females of this species and those of *Dasyllis fernaldi* Back. The latter may be distinguished however by the erect position of pile on posterior part of thorax, the greater abundance and entirely yellow color of pleural pile and more copious yellow hair on tibiae. Males of this species of *Dasyllis* may be recognized by the characteristic form of genital forceps, (Fig. 24).

***Laphria ferox* Williston.**

Laphria ferox Williston, S. W. On the North American Asilidæ (Dasypogoninae, Laphrinae), with a new genus of Syrphidæ. Trans. Am. Ent. Soc. 11, Dec., 1883, pp. 29-30 (Washington Territory).

This species was originally characterized from females only and knowledge of males now calls for some alteration of the description.

Vestiture black, except for beard, coxal hairs, part of the hairs on posterior part of thorax, all of which vary from whitish to golden. Pubescence of abdomen yellow to reddish golden, more dense on hind margins of segments and upon posterior and anterior segments, except in males in which the pale pubescence is confined to first four segments and posterior margins of others, the remaining hair being black. Wings blackish hyaline to smoky. The male genitalia of this species bear the most remarkable appendage of any of the genus seen by the writer. This is a single, median, brush-like process of each forceps which is broad, about half as long as the process, oblique and fimbriate at apex. It seems distinctly a lamella composed of coalesced bristles, which are separate toward the apex, but solidly fused near base. (Fig. 5). Length, 15-22 mm.

Specimens examined: Grouse Mt., Vancouver, B. C., July 1, 1904, (Hine); Victoria, B. C., July 20, 1902, (Hine); Hoquiam, Wash., Sept. 4, 1903, H. E. Burke, Homotype, (U. S. N. M.); Evaro, Mont., May 4, 1913, L. O. Swartz, (U. S. N. M.).

Laphria gilva Linnaeus.

Asilus gilvus Linnaeus, C. Systema Naturæ per regna tria naturæ secundum ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Ed. 10, 1758, genus 227, species 6. (Europe).

This species, the only one in the Genus *Laphria* known to be common to Europe and North America, was originally described in the Fauna Suecica, but it is unnecessary to give a citation prior to the tenth edition of the Systema Naturæ, the point of beginning of all modern zoological nomenclature. The very brief original characterization of the kind upon which Linnaeus prided himself, is entirely inadequate for recognition of a species of *Laphria*. I am satisfied of the identity of the North American and European forms of this complex, only because of the very detailed description, especially of the male genitalia, by Dr. William Lundbeck in the Diptera Danica.*

Laphria bilineata "Barnston's mss." Walker, Francis. List of the specimens of Dipterous Insects in the collection of the British Museum. 4, 1849, p. 1156. (St. Martin's Falls, Albany River, Hudson's Bay).

It is probable that this name is a synonym of *gilva*. Walker states: "Each segment from the third to the fifth adorned with a large triangular ferruginous spot, which is clothed with bright tawny hairs." Only two species of the general aspect of *gilva* are thus far known from the Nearctic region and one of those (*L. aimatis* n. sp.) has segments six and seven involved in the ferruginous area.

Description: Mystax black; surface above and at sides of facial prominence, silvery pruinose, and bearing decumbent silvery pile; beard silvery; hair of occiput mixed black and whitish. Disk of thorax with the following grayish pruinose markings; a longitudinally divided median vitta, and two lateral elliptical areas, rather acute posteriorly. Pile of thorax, fine, rather erect, mixed black and whitish. Bristles on sides of thorax and edge of scutellum black. First three abdominal segments and part of fourth with white pile, long and conspicuous at sides. Remainder of abdomen with rather recumbent pile, black except upon a median spot (of varying shape) upon segments 4-6, where the integument as well as the pile is ferruginous to golden. Traces of this pile occur in some specimens upon the segments 3 and 7. Legs with long black bristles, and long soft black and whitish hairs, those of coxæ, undersides of legs in general and of venter whitish. Wings smoky hyaline, clearer toward base. Male forceps, each with two lamellate appendages, of which one is median, broad (about equally

* Lundbeck, William. Diptera Danica, Genera and species of flies hitherto found in Denmark 2, 1908, pp. 49-51.

so throughout), well elevated, and about half as long as hypopygium, and the other lying on the inner side, narrower, somewhat curved and not so much elevated. (Fig. 6). Length 16-20 mm. .

This species is most easily separated from *L. aimatis* n. sp. by the essentially black seventh segment.

Specimens examined: Tyngsboro, Mass., Blanchard, (U. S. N. M., M. C. Z.); Dedham, Mass., (U. S. N. M.); Beverly, Mass., Burgess, (U. S. N. M.); Massachusetts, (M. C. Z.); Alpena, Mich., Wm. A. Nason, (Ill. State Lab.); Dickinson Co., Mich., July 27, 1909, (Hine); Sault Ste. Marie, Ont., (Hine); Whitefish Point, Lake Superior, H. G. Hubbard, (U. S. N. M.); Empire, Colo., August, J. D. Putnam, (M. C. Z.); Estes Park, Colo., August, 1892, F. H. Snow, (K. U.); Lame Deer, Mont., (U. S. N. M.).

***Laphria vivax* Williston.**

Laphria vivax Williston, S. W. Trans. Am. Ent. Soc. 11, Dec., 1883, p. 30. (Washington Territory.)

Ground color shining black. Mystax black; decumbent pile on face, beard, pile of tibiae decreasing in amount on posterior pairs, pile of pleurae and periphery of thorax, scutellum and abdomen, more abundant posteriorly and on sides and hind margins of segments, light greenish yellow to pale golden. Pile of occiput mixed with black, and short nearly erect pile on disk of thorax black. Hair on coxae pale golden, on femora mixed black and golden. Wings fumose hyaline, veins reddish. Male forceps with median brush like lamella and narrower curved, inner process not reaching end of forceps. (Fig. 7). Length 14-20 mm.

Specimens examined: Wellington, B. C., (Hine); Summit Co., Colo., T. D. A. Cockerell, (U. S. N. M.); Marshall Pass, Colo., Aug. 12, 1914, (U. S. N. M.).

***Laphria vivax anthemon* new subspecies.**

A male from the top of Las Vegas Range, New Mexico, 11,000 feet, W. P. Cockerell.

Differs from the typical form in having the median lamella of forceps more solidified, the inner process projecting beyond end of forceps, (Fig. 8) and the vestiture in general more highly colored. The facial pile, beard and pile of abdomen are bright golden and thoracic fringes and tibial hair red gold. On account of the more intense color of the abdominal pile, this appears denser than in *vivax* and as it is most abundant along posterior margins of segments, gives the insect a more distinctly banded appearance. Wing veins more distinctly reddish. Length, 18 mm.

One specimen, the type, data given above, (U. S. N. M.).

***Laphria ventralis* Williston.**

Laphria ventralis Williston, S. W. On the North American Asilidæ (Part 2). Trans. Am. Ent. Soc. 12, 1885, p. 55. (California.)

Mystax with only a few black bristles; remainder of mystax, facial pile, beard, coxal hair, thoracic fringes, pile and bristles of scutellum, and pile of abdomen light golden. On the sides of each segment from 3 to 7 the integument itself is ferruginous; posteriorly these spots are connected across hind margins of segments. The pile of abdomen is so arranged that viewed from above it appears most dense on sides and posterior parts of segments. Short, sparse, rather erect hair of thoracic disk pale golden, but in some lights appearing dark. Hair of legs mostly dark above, pale golden beneath. Wings smoky, veins reddish. Length, 18–20 mm.

In the male the mystax is wholly pale; and it as well as some of the remaining vestiture of the body, particularly the thoracic fringes, have a more ardent reddish gold color. The pile of thoracic disk is longer and more highly colored. The hypopygium is ferruginous with its various processes black. Lamellæ well solidified, median somewhat narrowed toward apex; inner much narrowed; both slightly upturned apically. (Fig. 9).

Specimens examined: Shasta District, Calif., July 1875, (M. C. Z.); Siskiyou, Calif., Aug. 7, (U. S. N. M.); Western Washington Territory, H. K. Morrison, (U. S. N. M.); Olympia, Wash., Sept. 24, Kincaid, (Ill. State Lab.)

***Laphria coquillettii* new species.**

Mystax and beard, pale golden in male; mixed black and pale golden in female. Hairs of occiput, upper pleuræ, and copious short black, nearly erect pile of anterior half of thorax black. Tuft of hair in front of halteres, scutellar bristles and coxal hair, pale golden. Posterior half of thorax and scutellum densely covered with long, recumbent golden hair. Ground color of first two and most of the third segment of abdomen black, semi-erect pubescence pale golden; of remainder of abdomen ferruginous to chestnut brown, pile more dense and recumbent, golden to red gold in color. Legs with mixed black and very pale golden hairs. Wings smoky, somewhat lighter toward base. Hypopygium ferruginous, process black; much like that of *ventralis*. (Fig. 10). Length 15–20 mm.

Type a male, Los Angeles Co., Calif., Coquillett, (U. S. N. M.). Allotype and paratype males, Switzers' Trail, 3,500 feet, San Gabriel Mts., Calif., June 11, 1910, F. Grinnell, (Hine).

Named in honor of the collector, the late D. W. Coquillett, an entomologist who contributed to knowledge of the Asilidæ, and did much good work among Diptera in general.

Laphria trux new species.

Mystax golden; beard, coxal hair and tufts before halteres yellowish-white. Pile of occiput, thorax in general, most of the first three segments of abdomen, hypopygium and legs in general black. The legs have some yellowish white hairs especially beneath and the usual short velvety ferruginous pile inside front tibiae and tarsi. The scutellum and a several times larger patch on thorax just in front of it are covered with long, recumbent slightly yellowish white hairs. Nearly half of the third segment and all of the remaining upper surface of abdomen is densely covered with close-lying orange-red pile. The integument is black. Wings brownish, some of the cells clearer within. Hypopygium large, of a very inflated and oblique type; inner apical process, striate, narrowed, curved, longitudinally twisted and slightly elevated toward apex, (Figs 11, 11a). A tuft of 4 strong bristles arising near base of this process forcibly suggests the origin of the median lamella seen on the forceps of some other species of *Laphria*. Length 27 mm.

The above is the description of a male from Los Angeles Co., Calif., Coquillett, (U. S. N. M.), Type.

A male about 25 mm. in length, collected on Switzer's Trial, 3,500 feet, San Gabriel Mts., Calif., by F. Grinnell (Hine) has the beard and coxal hair more grayish white, the mystax a little paler, with a few black hairs below, the tufts in front of halteres black and the recumbent hair on thorax and scutellum glistening white. For the present I place this in the species above described.

The latter specimen is a step in some directions toward *Laphria rapax* Osten Sacken,* but neither it nor the type of *L. trux* have whitish pile on face and first two abdominal segments, nor hair under antennæ altogether black, as stated in the original description of *rapax*.

The material I have seen suggests that there may be a series of species or at least subspecies of this group in California. The elucidation of this problem, together with that of the true status of *L. carbonarius* Snow (discussed below) would be an interesting study for some one who can do considerable field work in the area concerned.

Laphria trux var. **audax** new variety.

Differs from *trux*, in smaller size (18 mm.), hair in front of halteres and a few in lower part of mystax being black, and pale pile of thorax being glistening white and of abdomen golden.

* See copy of original description farther on, p. 159.

Type, male, from San Bernardino Co., Calif., Coquillett, (U. S. N. M.). Paratype, male, Los Angeles Co., Calif., Coquillett, (U. S. N. M.).

***Laphria rapax* Osten Sacken.**

Copy of original description:

"*Laphria rapax* n. sp. ♂ Head, posterior part of the thorax and two first abdominal segments with whitish, the remainder of the abdomen except the genitals, with ardent rufous pile; legs black. Length 20 mm. The lower part of the head and base of the proboscis beset with whitish pile; face likewise, but many, black, erect hairs are mixed with the white ones; hair under the antennæ altogether black. Front part of the thoracic dorsum with short black pile; the hind part with longer, semi-recumbent, whitish pile; scutellum with some whitish pile; male forceps very large; wings as usual brownish on the discal half and hyaline on the proximal. Hab.—Webber Lake, Sierra Nevada, July 28. A single male."*

***Laphria carbonarius* Snow.**

Laphria carbonarius nom. nov. Williston, Ms. *Laphria anthrax* Williston (nec Meigen). Snow, W. A. List of Asilidæ, supplementary to Osten Sacken's Catalogue of North American Diptera. 1878-1895. Kansas University Quarterly 4, No. 2, Oct. 1895, p. 181.

Laphria anthrax Williston, S. W. Trans. Am. Ent. Soc. 11, 1884, p. 29. (Northern California.)

Copy of original description:

"*Laphria anthrax* n. sp. Female—Black, head, thorax, legs, and first two segments of the abdomen wholly black pilose; remainder of the abdomen, except the extreme tip, densely clothed with close-lying bright yellowish-red pile. Wings blackish. Length, 21 mm.

"The pile of the face is abundant, on the lower part composed mostly of bristles. Dorsum of thorax shining, wholly covered with short black pile, except the short black bristles above the wing. The third-seventh segments of the abdomen are wholly concealed beneath bright orange-red pile; the pile lies very closely and thickly. Tip of abdomen and venter black pilose. Legs wholly black pilose. Wings dark brownish or blackish; the anal and second basal cells in large part hyaline; the middle of the fourth and fifth posterior cells lighter.

"One specimen, Northern California (O. T. Baron).

"This species must resemble *L. rapax* O. S., and it is possible it may be the other sex, but the entire lack of white pile renders such a view improbable."

* Osten Sacken, C. R. Western Diptera. Bul. U. S. Geol. & Geogr. Survey Terr. 3, 1877, p. 286.

Four females are at hand which agree fairly well with the above description. Williston lays stress on *entire* lack of white pile, but a homotype (as well as the other three specimens), shows some fine white pile on posterior part of thorax on scutellum and on third segment, a row across posterior part of segment being particularly noticeable. In one specimen this row of hairs is orange red. Length 18-22 mm.

Specimens examined: Los Angeles Co., Calif., Coquillett, two females, one a homotype, (U. S. N. M.); Switzer's Trail, 3,500 feet, San Gabriel Mts., Calif., June 11, 22, 1910, F. Grinnell, (Hine).

There is a very strong probability that *L. carbonarius* is based on females of one or all the species of the *rapax* group. Only males of the latter are known, and only females of *carbonarius*. More specimens, and especially field work directed toward solving this problem, are needed. For the present, keeping the names distinct is less confusing than would be uninformed lumping.

Laphria aimatis new species.

Mystax chiefly black in female; mixed with gray in male; face gray pollinose, more so in male; general vestiture, including beard, pile of thorax and legs mixed gray and black; thoracic and scutellar bristles black. Pleuræ and thorax in general with a faint gray bloom, somewhat intensified to form a divided median stripe. First three segments of abdomen and sides of others black with chiefly white pile which is long at sides of anterior segments. Discal portions of segments 4-7 dull to bright ferruginous with golden hair; sometimes a trace of this coloring on third segment, and scattered golden hairs on black integument. Wings smoky, paler toward base. Forceps stout, curved as viewed from above; inner apical process, striate, somewhat twisted longitudinally, narrowed at apex and not attaining apex of forceps. (Figs 12, 12b). Length 14-24 mm.

Type, a male from California, Baron, (U. S. N. M.); allotype, same data, (Kans. Univ).

Other specimens examined: Colorado, (U. S. N. M.); El Paso Co., Colo., June 7, 1914, Champlain, (U. S. N. M.); California, Edwards, (M. C. Z.); Sierra Nevada, California, (Kans. Univ); Placerville, Calif., March 12, 1913, (U. S. N. M.).

This species agrees better than any other I have seen with the description of *L. ætatus* Walker. (List 2, 1849, pp. 381-2 [St. Martin's Falls, Albany River, Hudson's Bay, Nova Scotia]),

but the size is somewhat different (*aetus* is 6 to 8 lines) and the geographical distribution does not encourage identification of the two. If Walker's remark "thinly clothed with hairs" applies to the abdomen of *L. aetus* there is no question that *aimatis* is a distinct species. Until the type of *aetus* is studied or at least until topotypic material is seen, it is better to use a new name. In various collections no fewer than 5 different species have been found wrongly labelled as *aetus*. The most important point that has been overlooked in making these determinations is Walker's statement that the abdomen is "ferruginous * * * * clothed with ferruginous hairs."

***Laphria sadales* Walker.**

Laphria sadales, Walker, Francis. List of the specimens of Dipterous Insects in the collection of the British Museum, 2, 1849, pp. 378-9. (New York.)

Laphria pubescens, Williston, S. W. Trans. Am. Ent. Soc. 11, 1884, p. 32. (Washington Territory and Mt. Hood, Oregon.)

Mystax black; decumbent pile at sides of face, beard and coxal hair, silvery white; areas bearing this pile and an oblique ellipse on each antero-lateral face of thorax, gray pollinose. Fine short pile of thorax and abdomen golden; in some specimens rather grayish on first and second segments especially at sides. Femora and tibiae yellowish or reddish with whitish to golden hairs and black bristles; remainder of legs black. Wings fumose, paler toward base. Hypopygium reddish to black; forceps curved as seen from above, inner apical process, short, pale, striate, slightly surpassing end of forceps. (Fig. 13). Length 9-16 mm.

Specimens examined: White Mountains, N. H. Morrison, (U. S. N. M.); Mt. Washington, N. H., Geo. Dimmock, (U. S. N. M.); Franconia, N. H., Geo. Dimmock, (U. S. N. M.); Rutland, Vt., Aug., 1916, Chittenden, (Hine); Axton, N. Y., June, 1901, A. D. MacGillivray, (Hine); Nicolum River, Hope, B. C., July 13, 1906, (Hine); Hope Mts., B. C., July 27, 1906, R. V. Harvey, (Hine); Kaslo, B. C., May 30, June 1, H. G. Dyar, (U. S. N. M.); Washington Territory, (Kans. Univ.); Olympia, Wash., (U. S. N. M.); Pullman, Wash., July 6, H. E. Burke, (U. S. N. M.); Mt. Hood, Ore., H. K. Morrisson, (U. S. N. M.); Fieldbrook, Calif., May 29, 1903, H. S. Barber, (U. S. N. M.); Humboldt Co., Calif., June 14, H. S. Barber, (U. S. N. M.).

Laphria felis Osten Sacken.

Lampria felis Osten Sacken. Bul. U. S. Geol. and Geogr. Survey Terr. 3, 1877, p. 286. (Webber Lake, Sierra Nevada, Calif.)

Laphria felis Williston. Trans. Am. Ent. Soc. 12, 1885, p. 54.

Laphria xanthippe Williston. Trans. Am. Ent. Soc. 11, 1884, pp. 31-32. (Mt. Hood, Ore.)

Williston (loc. prim. cit.) first included *Lampria felis* Osten Sacken under *Laphria*, noting that the femora do not show the tubercles characteristic of that genus. Mr. Nathan Banks has kindly corroborated this information by examination of the type. *L. xanthippe* Williston differs from *L. felis* only in variable color characters.

The principal variations in color are specified in the subjoined key to the varieties. A general characterization is:

Mystax black (yellow in var. *crocea*), beard and coxal hair white in male, grayish to black in female, decumbent pile at sides of face silvery. Inner margin of orbits and oblique fascia on front of thorax silvery or gray pollinose. Short sparse hair on disk of thorax and scutellum appearing light golden in some lights, blackish in others. First two segments of abdomen and most of third, black, with white pile, longer on sides near base; remainder of abdomen except sides of some segments yellow to red-brown. This color is pale in males and the pile is golden; duller in females with the pile black. The bristles of thorax and vestiture of legs, except the usual velvety golden pile on inner face of front ones, are black. Wings smoky even to base; interior of some cells clearer. Hypopygium yellowish or reddish with black hairs; forceps curved as seen from above; inner apical process a little longer and more pointed than in *L. sadales* and recurrent further along inner margin of forceps; slightly separated from forceps as seen from side and more or less decurved at tip. (Figs 14, 15). Length 13-18 mm.

KEY TO COLOR VARIETIES.

- a. Mystax black.
 - b. Legs entirely black.....var. *atripes* n. var.
 - bb. Legs not entirely black.
 - c. Legs not entirely reddish.
 - d. Hind femora reddish below.....var. *xanthippe* Williston.
 - dd. Hind femora entirely reddish; others reddish below..var. *varipes* n. var.
 - cc. Legs entirely reddish.....var. *felis* Osten Sacken.
 - aa. Mystax yellow to golden; legs entirely yellowish to reddish..var. *crocea* n. var.

Laphria felis var. *atripes* new variety.

Type a female from Jenny Creek, Tolland, Colo., July 27, 1917, E. C. Jackson, (U. S. N. M.).

Laphria felis var. *xanthippe* Williston.

Mt. Hood, Ore., H. K. Morrison, (U. S. N. M.).

Hope Mts., B. C., July 24, 1906, R. V. Harvey, (Hine).

***Laphria felis* var. *varipes* new variety.**

Colorado, (U. S. N. M.); Beulah, N. Mex., July 22, Cockerell.
A male, the type, (U. S. N. M.).

***Laphria felis* var. *felis* Osten Sacken.**

Kaslo, B. C., June 8, R. P. Currie, (U. S. N. M.); Yellowstone Park, July 25, 1907, W. Robinson, (Hine); Currant Creek, 8,000 feet, Uinta National Forest, Utah, Aug. 13, 1917, J. Silver, (Biol. Survey).

***Laphria felis* var. *crocea* new variety.**

Type a male from Pullman, Washington, July 6, H. E. Burke, (U. S. N. M.).

Other specimens examined: Mt. Hood, Ore., H. K. Morrison, (U. S. N. M.); Hope Mts., B. C., July 18 and 27, 1900, R. V. Harvey, (Hine).

I am tempted to call this form a distinct species, and would, except for the fact that two males from Mt. Hood, Ore., one var. *xanthippe* and one var. *crocea* are so nearly alike in almost all respects except the color of mystax and beard, that it makes me doubt whether the slight differences in genitalia (Fig. 15) are significant.

***Laphria scorio* new species.**

Mystax black, decumbent pile of face golden in male, whitish to greenish yellow in female. Beard and coxal hair grayish to silvery. Face, coxæ, oblique anterior fascia of thorax and pleuræ, more or less gray to white pollinose. Rather sparse pile of thoracic disk and scutellum mostly golden; more decumbent and conspicuous behind. Thoracic bristles black except tuft in front of halteres which is yellowish. Pile of abdomen golden, being more recumbent on posterior parts of segments and of abdomen as a whole, it there appears more dense. Hair of legs gray and black; wings pale fumose. Hypopygium black; forceps stout, curved; inner apical process, twisted longitudinally so that its median part lies in a vertical plane, surpassing forceps a little and deflexed apically so that it almost touches apex of forceps. A pair of the hooks from interior of hypopygium often are in such a position as to obscure the relative positions of process and apex of forceps. There is also some variation in the shape and deflexion of process (illustrated in Figure 16), but for the present these are not given taxonomic recognition. Length, 14-17 mm.

The females, difficult to distinguish from those of the following two species, may best be recognized by the hair of thorax

being almost uniform in color and not forming a distinct median narrow golden triangle.

Type male and allotype female, White Mts., Morrison, (U. S. N. M.). Several paratypes with same date and one female from Camel's Hump, Vt., P. S. Sprague, (U. S. N. M.).

A male from Chateaugay, N. Y., and a female from New Hampshire, (M. C. Z.).

Laphria index new species.

Mystax black; pollen and decumbent pile of face silvery; occiput, coxæ, pleuræ, fascia on front of thorax, gray to white pollinose, hair where present concolorous. Thorax with a median triangle of pale to reddish golden hair, about as wide of scutellum behind, rapidly narrowing and evanescent anteriorly; remaining pile on disk of thorax consisting of longer whitish, sometimes golden, and shorter black hairs, bristles black. Hair on scutellum tends to be paler and the marginal bristles are white. Pile of abdomen, except for whitish hairs on sides of first three segments, pale to reddish golden; rather dense in well preserved specimens, but apparently rather easily lost. Hair of legs gray and black. Wings fumose paler toward base. Hypopygium black, black bristled; apical process somewhat reddish, beveled on outer side, but not twisted, decurved forming with apex of forceps a figure like an opposed thumb and index finger. (Fig. 17). Length 13-18 mm.

So far I have not found a way of certainly distinguishing the females of this species from the next; they appear to be the more robust specimens with the golden thoracic triangle more conspicuous.

Type, a male, Harrisburg, Pa., June 15, 1913, Champlain, (U. S. N. M.).

Other specimens examined: Canada, (U. S. N. M.); White Mts., N. H., (U. S. N. M.); New York, (M. C. Z.); Fort Lee, N. J., May 30, R. C. Osburn, (Hine); Pennsylvania, (K. U.); Harrisburg, Pa., June 28, 1912, Champlain, (Walton), June 15, 1917, W. S. Fisher, (Fisher); June 4, 1915, July 20, 1916, June 12, 1914, June 5, 1914, March 20, 1915, pupa collected, W. S. Fisher, (U. S. N. M.); Lingletown, Pa., May 21, 1915, May 17, 1915, pupa collected, W. S. Fisher, (U. S. N. M.); Stoverdale, Pa., June 6, 1916, W. S. Fisher, (U. S. N. M.); Dead Run, Va., May 27, 1917, W. L. McAtee, (Biol. Survey).

Females from North Carolina, Ohio, Illinois and Wyoming may be this or a related species. The Illinois specimen is labelled *ferruginea* Le Baron ms. Mr. Banks informs me that a specimen in the Museum of Comparative Zoology bears the manuscript name *walkeri* Loew.

***Laphria ithypyga* new species.**

Scarcely differs from last in general appearance, but male genitalia are very distinct. Hypopygium black, black bristled, straighter than usual in the genus; apical process not twisted, broad, stout, forming the principal part of apex of forceps; hollowed out within and forming with lower apical angle of forceps a considerable emargination which is broadest distally. (Fig. 18). Length 12–17 mm.

Type, male, Harrisburg, Pa., June 18, W. R. Walton, (U. S. N. M.).

Other specimens (males) examined: Lingletown, Pa., August 4, 1912, Champlain, (Walton); Harrisburg, Pa., July 20, 1916, W. S. Fisher, (Fisher); Philadelphia, Pa., (Hine); Beltsville, Md., June 4, 1916, W. R. Walton, (Walton).

***Laphria sicula* new species.**

Laphria canis, in large part, of previous authors, not of Williston according to the male type.

Mystax black; face, occiput, coxæ, pleuræ and usual oblique fascia on front of thorax gray to white pollinose, with hair where present mostly concolorous. Thoracic bristles and tuft in front of halteres black. Sparse pile of thoracic dorsum white, of abdomen black and white, the latter more prominent on sides of posterior parts of segments. Legs with black and white hair. Wings dark fumose, slightly paler toward base. Hypopygium black with black bristles and a few pale hairs on end of anal valve; forceps from above stout, curved abruptly, tapering to rather acute apex; from side, appearing shallowly emarginate at apex, claspers borne by forceps unusually stout and extraordinarily large at base where inserted in forceps. (Fig. 19). Length 9–14 mm.

Type male and allotype female, taken in copula, Plummers Island, Md., July 21, 1907, A. K. Fisher, (U. S. N. M.).

Records for other females of this species are not given for the reason that with present knowledge they are not separable from females of *L. canis* and of *L. winnemana*.

The males examined represent the following localities: Heckton Mills, Pa., June 15, 1909, W. R. Walton, (Walton); Lingletown, Pa., Aug. 5, 1915, W. S. Fisher, (U. S. N. M.); Great Falls, Va., June 29, 1915, August 17, 1916, August 28, 1917, C. T. Greene, (U. S. N. M.); Scott's Run, Va., July 25, 1915, W. L. McAtee, (Biol. Survey); Langley, Va., July 16, 1911, W. D. Appel, (U. S. N. M.); Dead Run, Va., June 9, 19, July 25, 1915, R. C. Shannon, (U. S. N. M.); Falls Church, Va.,

July 3, 1916, J. N. Knull, (U. S. N. M.); Plummerville Id., Md., June 18, 1914, R. C. Shannon, July 14, 1907, A. K. Fisher, (U. S. N. M.); June 30, 1907, July 14, 1907, A. K. Fisher, (Biol. Survey); Lakeland to Riverdale, Md., July 14, 1916, W. L. McAtee, (Biol. Survey); Ira, Summit Co., Ohio, July 24, 1910, (Hine); Urbana, Ill., July 15, 1915, (Ill. State Lab. Nat. Hist.); Monticello, Ill., June 30, 1914, (Ill. State Lab. Nat. Hist.).

***Laphria franciscana* Bigot.**

Laphria franciscana Bigot, J. M. F. Dipteres nouveaux ou peu connus. 10 (1). Annales de la Societe Entomologique de France, 5th ser., 8, 1878. p. 225. (California.)

There is little in general appearance to distinguish this species from *L. sicula*. In both of these species the females have less pale hair among bristles of mystax (sometimes none), and less white hair on sides of abdominal segments. In both sexes, *L. franciscana* has notably less of the latter pile than has *sicula*. I am unable to perceive any differential coloring of thoracic pile, all of it appearing pale when held in the proper light.

Both species have a shining, opalescent, bluish, black surface which is characteristic. Color of hypopygium and its hairs as in *L. sicula*; forceps from above stout, curved, constricted beyond middle, then expanded into a hollowed out spoon shaped apex; from side only slightly emarginate apically, claspers not so stout and without large basal insertion as in *sicula* (Fig. 20). Length 12-16 mm.

Specimens examined: Grouse Mt., B. C., June 29, 1905, (Hine); Western Washington Territory, H. K. Morrison, (U. S. N. M.); Siskiyou Co., Calif., (U. S. N. M.); Santa Cruz Mts., Calif., (U. S. N. M.).

A general and somewhat damaged specimen from Cayuga Lake, N. Y., (M. C. Z.), has genitalia more like *franciscana* than *sicula*, but agrees better with the latter in the amount of white pile on abdomen. On account of its condition it is not more definitely placed.

It should not be overlooked that the present identification of *L. franciscana* is perfunctory. Without examination of the type no identification of a species of *Laphria* is beyond question.

***Laphria canis* Williston.**

Laphria canis, Williston, S. W. Trans. Am. Ent. Soc. 11, 1884, p. 31. (Connecticut.)

Laphria dispar Banks, N. Four new species of Asilidæ. Can. Ent. 43, No. 4, April, 1911, p. 130. (Ithaca, N. Y., Hecton Mills, Pa.).

Laphria disparella nom. nov. Banks, N. Notes on Diptera Proc. Ent. Soc. Wash. 15, No. 1, April, 1913, p. 52. For *L. dispar* Banks not Coquillett.

Examination of the male type of *L. canis* Williston regrettably necessitates the above synonymy. I have a cotype male of *L. disparella* Banks and the correctness of my figures of the genitalia has been verified from the type by Mr. Banks.

The type of *L. canis* is of a variety which I had intended to describe as a new variety of *L. disparella*, but which now of course becomes the typical form.

***Laphria canis* variety *canis* Williston.**

Mystax black; decumbent pile at sides of face silvery; coxal hair, beard, in fact all pubescence of lower half of occiput grayish, of upper half black. Pollinose areas as in related forms. Body thinly clothed with pale pile, which on thorax appears slightly golden in some lights and black in others. Thoracic bristles, except tuft in front of halteres, black, the latter, pale. Scutellar bristles pale to black. Pale hair of abdomen is longest and whitest on sides of segments, especially toward base of abdomen; some of the short pubescence appears black in some lights, especially on last segment, where some of it also is golden. Hair of legs black and white. Wings slightly fumose. Hypopygium black, black haired except for a tuft of pale hairs on apex of anal valve; forceps from above stout, abruptly tapering to a rounded and slightly upturned apex; a view within shows that forceps is strongly hollowed out and that a thin plate forms the inner apical portion between the thickened apical ridge and body of forceps; from side hypopygium appears unusually inflated, almost globular, forceps simple in exterior modeling, its apical projection nearly straight, the margin slightly reflexed below. Length 12 mm. (Description from type).

Other specimens from which figures (Fig. 21) of genitalia were taken, show variation in length from 9 to 14 mm.

Specimens examined: Connecticut, type, (Kans. Univ.); New Haven, Conn., June 4, 10, 1911, Champlain, (Walton); Perdix, Pa., May 27, 1911, W. S. Fisher, (Walton); Enola, Pa., June 13, 1909, (Walton); Carlisle Junction, Pa., June 22, 1909, W. R. Walton, (Walton); Plummerville, Md., June 4, 1916, H. L. Viereck, (Biol. Survey); Virginia, near Plummerville Id., Md., June 7, 1908, W. L. McAtee, (Biol. Survey); Dead Run, Va., July 18, 1916, R. C. Shannon, (U. S. N. M.); Glen-carlyn to Mouth, Four-mile Run, Va., June 11, 1916, W. L.

McAtee, (Biol. Survey); Falls Church, Va., July 3, 1916, J. N. Knull, (U. S. N. M.); Vinton, Ohio, June 5-12, 1900, (Hine); Ira, Summit Co., Ohio, (Hine).

***Laphria canis* var. *disparella* Banks.**

Bibliographic references previously.

Variety *disparella* is distinguished from the typical variety by the golden color of hair on the abdomen and sometimes of the pile on face.

Mystax black, decumbent pile of face white to golden. Pollinose areas as in typical form. Beard and coxal hair gray to silvery. Short, sparse hair of thoracic disk, tuft in front of halteres and scutellar pile and bristles pale, tinged with golden. The scutellar bristles and halteral tuft vary to black. Hair of abdomen rather sparse, golden, most noticeable on hind margins and posterior abdominal segments.

Specimens examined: Heckton Mills, Pa., June 15, 1909, W. R. Walton, cotype, (Walton); Inglenook, Pa., June 9, 1911, W. S. Fisher, June 27, 1912, Champlain, (Walton); Inglenook, Pa., June 14, 22, 1917, W. S. Fisher, (Fisher); Lingletown, Pa., June 8, 1912, Champlain, (Walton); Harrisburg, Pa., June 17, 1912, Champlain, June 18, July 7, W. R. Walton, (Walton); Ithaca, N. Y., June 9, 1906, (Hine).

***Laphria winnemana* new species.**

Mystax black, decumbent pile of face silvery. Beard and coxal hair grayish white; usual areas pollinose. Thoracic bristles and tuft in front of halteres black. Short sparse hair of thoracic dorsum pale golden when viewed from in front, appearing black in some lights; longer hair of scutellum pale golden, bristles pale to black. Abdomen with sparse pale hair which is especially long at sides and mostly white on first three segments, and mostly golden (may appear black in some lights) on remaining segments, being especially prominent on seventh. Long hair beneath abdomen very pale golden; hair of legs gray and black. Wings dark fumose paler toward base. Hypopygium black with black and white hairs; forceps from above abruptly narrowed into a slender process which is enlarged into a dilated trapeziform apex. The lamella along inner apical margin is directed downward and opaque, not more horizontal and translucent as in *L. canis*. From side forceps appears much like that of *L. canis*, the lamella just mentioned being much more conspicuous however. (Fig. 22). Length, 11-14 mm.

Type a male from Plummers Island, Md., July 11, 1909, W. L. McAtee, (U. S. N. M.).

Other specimens examined: Plummers Id., Md., June 27, 1915, R. C. Shannon, (U. S. N. M.); Scotts Run, Va., August 12, 1917, W. L. McAtee, (Biol. Survey); Great Falls, Va., June 28, 1917, C. T. Greene, (U. S. N. M.); Dead Run, Va., July 11, 1915, July 18, 1916, July 28, 1915, R. C. Shannon, (U. S. N. M.); Maryland, near Plummers Id., June 30, 1914, R. C. Shannon, (U. S. N. M.); Marsh Run, Pa., July 16, 1909, (Walton); A teneral specimen labelled only Can. (U. S. N. M.) appears to be this species.

***Laphria saffrana* Fabricius.**

Laphria saffrana Fabricius, J. C. Systema Antliatorum secundum ordines, genera, species adiectis synonymis, locis, observationibus, descriptionibus, 1805, p. 160. (California).

Mystax, facial and occipital pile, hair of coxæ and legs, two tufts on each side of thorax, two on disk, margin of disk of thorax (broadly interrupted anteriorly, narrowly so posteriorly) and dense pile of abdomen, yellow to bright golden or reddish yellow. The hairs of palpi are dark reddish and a little hair beneath mystax is blackish. Body surface piceous where exposed, contrasting strongly with the yellow pile; integument of legs yellow. The disk of thorax, except for yellowish areas mentioned, and the scutellum are covered with short black pile. Wings fumose. Hypopygium reddish with pale hairs; forceps, stout, straight, apex on inner side as seen from above, rounded angulate, inner edge near base with an inwardly and downwardly projecting broad lobe; seen from side forceps is oblique at apex, and shallowly emarginate, both on apex and lower side. (Fig. 23). Length 17-25 mm.

Specimens examined: St. Elmo, Va., F. C. Pratt, (U. S. N. M.); Tryon, N. C., W. F. Fiske, (U. S. N. M.); Southern Pines, N. C., April 21, 1908, May 2, 12, 14, 15, 1908, (Hine); Billys Id., Okefenokee Swamp, Ga., June, 1912, (Hine); Southern Georgia, Morrison, (U. S. N. M.); Florida, (Hine, Ill. State Lab. Nat. Hist.); Sand Point, Fla., May 3, (U. S. N. M.); Archer, Fla., March, 1882, (U. S. N. M.).

Kertész puts* *Laphria saffrana* in the genus *Dasyllis* and the genital forceps, admittedly are somewhat similar to those of species of that genus. (See Figs. 24, 25). *L. saffrana* does not have the *Dasyllis* habitus however, which is chiefly due to abundant, long, spreading pile, in large areas of strongly contrasting colors. The short crisp pile of *saffrana* seems to ally it more with the species of *Laphria*.

* Kertész, C. Catalogus Dipteriorum, 4, 1909, p. 174.

EXPLANATION OF PLATES.

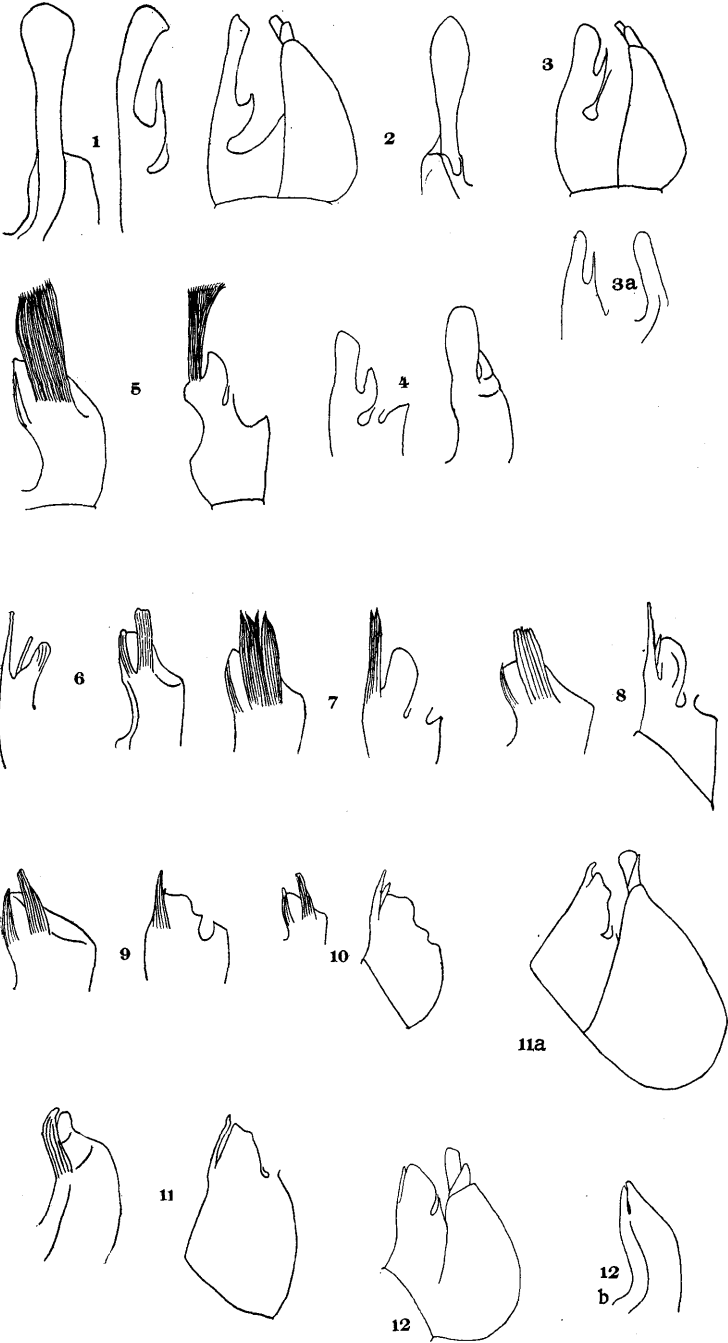
PLATE X.

- Fig. 1. *Laphria vultur*: forceps from above and from side.
Fig. 2. *Laphria sericea*: hypopygium from side; forceps from above.
Fig. 3. *Laphria aktis*: hypopygium from side.
Fig. 3a. *Laphria aktis*: forceps from side and from above.
Fig. 4. *Laphria janus*: forceps from side and from above.
Fig. 5. *Laphria ferox*: forceps from above and from side.
Fig. 6. *Laphria gilva*: forceps from side and from above.
Fig. 7. *Laphria vivax*: forceps from above and from side.
Fig. 8. *Laphria vivax anthemom*: forceps from above and from side.
Fig. 9. *Laphria ventralis*: forceps from above and from side.
Fig. 10. *Laphria coquillettii*: forceps from above and from side.
Fig. 11. *Laphria trux*: forceps from above and from side.
Fig. 11a. *Laphria trux*: hypopygium from side.
Fig. 12. *Laphria aimatis*: hypopygium from side.
Fig. 12b. *Laphria aimatis*: forceps from above.

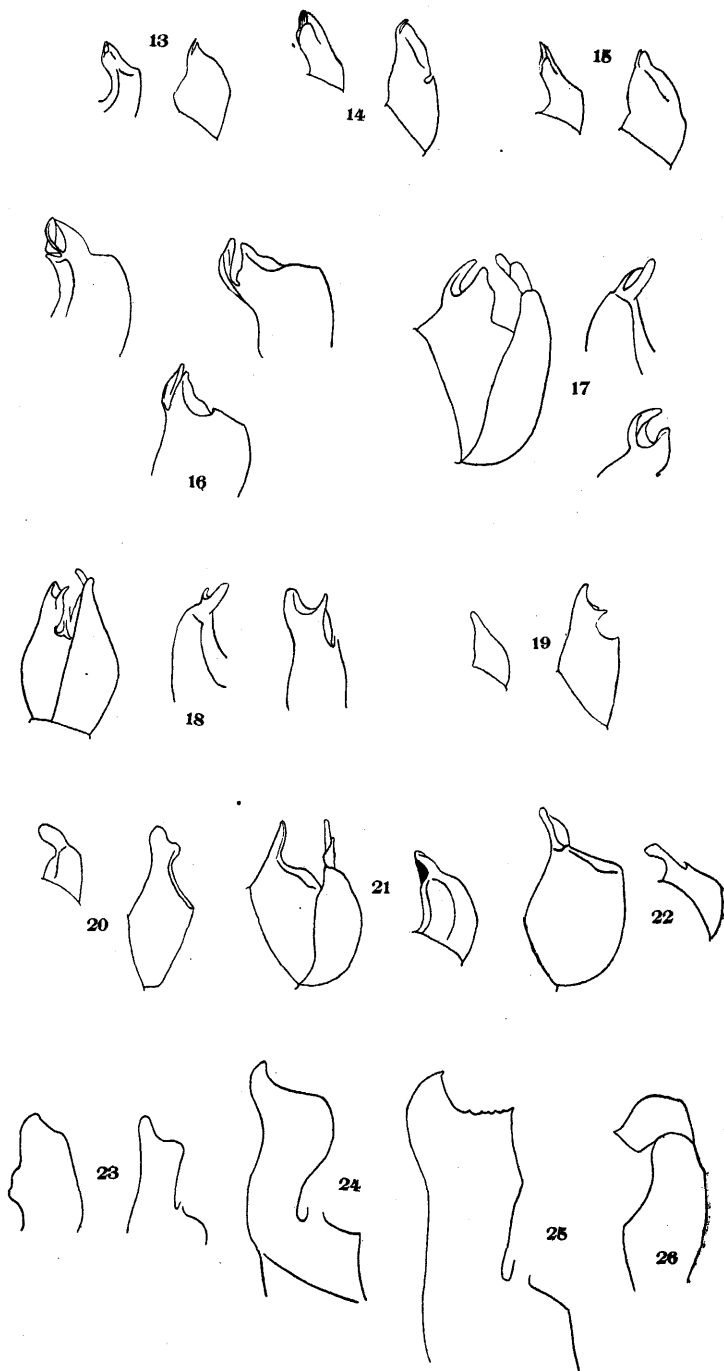
PLATE XI.

- Fig. 13. *Laphria sadales*: forceps from above and from side.
Fig. 14. *Laphria felis*: forceps from above and from side.
Fig. 15. *Laphria felis* var *crocea*: forceps from above and from side.
Fig. 16. *Laphria scorpio*: forceps from above, from side (lower figure), and showing greatest emargination (upper right).
Fig. 17. *Laphria index*: hypopygium from side; forceps from above, and showing greatest emargination (lower right).
Fig. 18. *Laphria ithygya*: hypopygium from side; forceps from above and showing greatest emargination.
Fig. 19. *Laphria sicula*: forceps from above and from side.
Fig. 20. *Laphria franciscana*: forceps from above and from side.
Fig. 21. *Laphria canis*: hypopygium from side; forceps from above.
Fig. 22. *Laphria winnemana*: hypopygium from side; forceps from above.
Fig. 23. *Laphria saffrana*: forceps from above and from side.
Fig. 24. *Dasyllis fernaldi*: forceps from side.
Fig. 25. *Dasyllis grossa*: forceps from side.
Fig. 26. *Nusa* n. sp. near *rubida*: forceps from side.

All Figures about 3.3 times natural size.



Male Genitalia of *Laphria*



Male Genitalia of *Laphria*