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THE CRANE-FLIES OF NEW CALEDONIA (DIPTERA, TIPULIDAE).

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(Read 2nd June, 1948).

Introduction.

Our knowledge of the Tipulidae of New Caledonia, while still obviously incomplete, has developed very rapidly in recent years. The first collections of these flies made on the island were taken by Professor and Mrs. T. D. A. Cockerell in 1928, representing six species (Alexander, 1929).[1] Later a few additional forms were secured by Professor Jean Risbec, of Noumea (Alexander, 1934*a*, 1934*b*), bringing the list to nine species. In 1940 Dr. F. X. Williams was sent to the island by the Hawaiian Sugar Planters' Association to investigate certain insect pests of agricultural and medical importance (Williams, 1943, 1945); among the numerous insects taken by him were nine further species of Tipulidae (Alexander, 1945), bringing the list to the present date to 18 species.

During the second World War many American troops were stationed on New Caledonia for varying lengths of time and numerous miscellaneous insects were taken and were returned to the States. Two of these men, Mr. Charles F. Remington and Mr. John C. Herron, made outstanding collections, the Tipulidae being most generously presented to me. Of these the large and representative series taken by Mr. Herron was most noteworthy, and has provided the chief basis for the present report. Still more recently, further interesting Tipulidae have been collected by Mr. L. Garrigou. I wish to express my very sincere thanks to Messrs. Herron, Garrigou and Remington for their appreciated co-operation in this study and for the privilege of retaining the types of the new species in my collection. As a result of the information presented herewith the list of Tipulidae for New Caledonia has been increased from 18 species to 46, and still further additions to the record may be expected as a result of future collecting.

The strict biogeographical position of New Caledonia within the Australasian Region has been discussed by workers on various groups of animals and there is still lack of agreement as to the true position of the island, and particularly as to the means of origin of its fauna and flora. Tillyard (1917 : 292), on the basis of the Odonata, referred New Caledonia to the Papuan Province of the Australian Region. Mann (1921), from a study of the ants, referred the island, together with Fiji and probably the New Hebrides, to the Melanesian subregion. Forel (1928 : 149, 156), likewise from a consideration of the ants, has placed New Caledonia as a subregion of the Australian faunal region.

[1] Dates in parentheses refer to the bibliography.

Earlier workers, particularly Sarasin (1925) held that the island during mid-Tertiary was a part of the Australian Continent and that in the late Tertiary it was connected with New Guinea by a chain of islands. More recent papers by Mayr (1939, 1944), introducing a new and vigorous school of thought, completely discount the idea of land connections and maintain that since its emergence from the ocean in Oligocene times, New Caledonia has never been completely submerged and that in all probability it has never been in connection with either Australia or New Guinea. Mayr believes that not only New Caledonia but other neighbouring island groups, as New Hebrides and Fiji, are not remnants of a former ancient continental land mass, but are true oceanic islands with no earlier connections with any of the major land areas. On such a view the fauna and flora of New Caledonia would be a reduced and unbalanced one, derived over a vast period of time by waif methods, chiefly by the agencies of wind and water. From his unparalleled knowledge of the avifauna, Mayr would include the island in the Polynesian subregion while keeping strictly in mind the large endemic fauna and the various Australian elements. He (1939*b* : 210) concludes that it is not practical to include New Caledonia with the Australian Region because of the strong Papuan element present.

The generic and subgeneric composition of the Tipulid fauna of New Caledonia, as at present known, is compared below with certain other critical areas.

Group.	New Caledonia.	Australia.	New Zealand.	Chile, see Brazil.
Macromastix	*	*	*	*
Phacelodocera	*	*	.	*
Plusiomyia	*	*	.	.
Limonia				
Limonia	*	*	*	*
Libnotes	*	*	.	.
Dicranomyia	*	*	*	*
Idioglochina	*	*	*	.
Geranomyia	*	*	.	*
Thrypticomyia	*	*	.	.
Pseudoglochina	*	*	.	
Doaneomyia	*	.	.	.
Orimarga	*	*	.	*
Helius				
Helius	*	*	*	*
Eurhamphidia	*	*	.	.
Idiohelius	*	.	.	.
Epiphragma	*	*	.	*
Gynoplistia				
Paralimnophila	*	*	*	*
Gynoplistia	*	*	*	*
Gonomyia				
Idiocera	*	.	.	.
Gonomyia	*	.	.	*
Lipophleps	*	*	*	*

Group.	New Caledonia.	Australia.	New Zealand.	Chile, see Brazil.
Gymnastes				
Paragymnastes	*	*	.	*
Erioptera				
Trimicra	*	*	*	*
Molophilus	*	*	*	*
Styringomyia	*	*	.	*

Thus of the 25 generic and subgeneric groups of TIPULIDAE at present known from New Caledonia, no fewer than 21 likewise occur in Australia, but only 10 in New Zealand. There is no evidence at all of a past connection with New Zealand, but very decidedly so in the case of Australia. Particular attention should be called to the two groups *Plusiomyia* and *Phacelodocera*, large-sized Tipuline forms with branched antennae, eminently characteristic of Australia, especially Tasmania, Victoria and New South Wales. None of these TIPULINAE with branched antennae occurs in New Zealand, but some very closely allied types, such as *Ozodicera*, are found in South America, particularly in south-eastern Brazil. If, as Mayr indicates, New Caledonia first arose from the ocean in the Oligocene and since that time has had no possible land connection with either New Zealand or Australia, then we are forced to accept the belief that the TIPULIDAE as known represent a waif fauna that has reached the island by flotsam or similar methods. If the land was much older than the Oligocene and had had an early connection with Australia, very primitive crane-fly groups, like the genera *Macromastix*, *Plusiomyia* and *Phacelodocera*, might well have reached the island long before the first bird types evolved, even including the endemic relict family RHYNOCHETIDAE, the kagu. As is now appreciated, some of the Holometabolous orders of insects were in existence at the end of the Palaeozoic and the spread of such ancient groups should be considered separately and not be confused with the much later dispersal of either birds or mammals in the Tertiary or perhaps slightly earlier in the Cretaceous. By the time of the Baltic Amber (Lower Oligocene), some 35,000,000 years ago, very many if not most of the present genera and subgenera of TIPULIDAE were already in existence, and are not separable from types or actual groups still in existence (Alexander, 1931).

COLLECTING STATIONS.

I am greatly indebted to Mr. Herron for detailed accounts and photographs showing all the localities where his collecting was done. Certain of these data are presented herewith in order better to explain the difficult and restricted conditions under which insect collecting in New Caledonia is accomplished.

Mr. Herron was on the island from January, 1944, through January, 1946, while serving as a member of the American armed forces. Although he visited most parts of the island that are traversed by road, virtually all of his TIPULIDAE were taken in the southern part, in the general vicinity of Noumea and La Foa. The following paragraphs have been adapted from Mr. Herron's more elaborate account.

The mountains of New Caledonia are relatively low. Mount Mou (4003 ft.) is among the highest, while Mount Panié (5,414 ft.), near the northern

end is the highest point. The forests for the most part are located in the zone between 1200 and 2200 ft. Above this it becomes dry and barren, with only a few kauri pines (*Agathis*) outlined against the sky. The high forests are very scarce and are so open that collecting is extremely difficult. The insects are associated chiefly with the waterways and with the wet coves of the forest. Even though forest shows well up on the mountain slopes, often it is not dense enough to support more than a meagre insect fauna. Even the most dense forests of the central mountain chain are not above 1880 to 2000 ft. The forests here do not begin at sea-level, and go to the mountain tops, as on some tropical islands, but occur in pockets, directly associated with and dependent upon the available moisture supply. Where there is no canopy to keep out the hot rays of the sun the insects are just not to be found.

Saint Louis.

Forest lying directly inland from the Saint Louis Mission and the peak behind, known locally as Mont Chapeau Gendarme ; most collecting between 1100 and 1200 ft. ; October, 1925, through January, 1946. A large permanent stream flows from the forest past the mission grounds. This stream is fringed with trees, the forest pockets becoming larger and more dense as one progresses upward and inland. An interesting feature of these pockets is that they are found at different elevations, with only a very narrow line of trees along the stream acting as connecting links. The streams themselves often tumble over sheer waterfalls or down rocky cascades, then flowing over more level ground only to drop over other falls or cascades. The forest proper begins at about two miles inland, and one's first impression is that it is composed chiefly of tree ferns. However these latter form only a narrow fringe at the forest's edge with fewer individuals scattered throughout, especially along the streams. The most striking thing upon entering one of these forest areas is the sudden and drastic change in temperature as compared with that just at the edge or out on the niaouli (*Melaleuca*) clad slopes. The humidity is high, but it is definitely more comfortable. In the forest are numerous types of ferns of various heights, including at least two species of tree ferns that attain a height of 20 ft., grading down to the very low fern types that are generally similar to the low fern types of our own forests. The wandering jew is abundant here as in many other forest pockets, generally occurring along the streams or over a seeping bank or ledge. The serpentine terrain of the island continues within the forest, providing for many small streams that feed into three major brooks leading downward and seaward. Each of such brooks or brooklets follows much the same pattern, winding incessantly and with a small fall or cascade at practically every turn. The forest has been badly cut over but evidently fire has never invaded it and enough small trees are left to cover and protect the friable soil.

The lower forest seems to be characterized by the invasion of fern associations well back from the streams and by the very moist soil that is partially caused by the incessant seepage from the rock ledges. The undergrowth is fern which is very dense and invades every cove and shelf. These thickets beneath the forest cover are so dense that little light gets through. I would believe that on the average these fern thickets cease at near 1800 ft. altitude. It is in this type of location that Tipulids are found in greatest abundance. All

depressions and coves shelter them and the hotter and windier it becomes, the closer to the ground they are found, this being especially true of the smaller and more fragile forms. Larger species, such as *Phacelodocera herroni*, were most often taken at from 2 to 4 ft. above the forest floor.

The upper forest of the eastern slopes is comprised of the same tree species, but there is no constant seepage, only intermittent streams. Ferns are still present though very scattered, the trees become smaller, the brush more open. In its general gross outline this zone reminds one very much of a second-growth oak association in the mid-western United States. As a rule, the forest gradually thins away until one reaches a definite upper margin and finally emerges into a bracken association and thence into one of sedges and scrub. This, in turn, gives way to practically a barren soil on the mountain tops.

Naturally the fauna within the forest varies during the different seasons. The months of August and September seem to be the period of greatest inactivity as adults. There are no really low temperatures during the winter months.

TIPULIDAE : *Macromastix* (*Macromastix*) *novocaledonica ; M.* (*M.*) *repleta ; Plusiomyia neocaladonica ; Phacelodocera herroni ; Limonia* (*Limonia*) *hera ; L.* (*Libnotes*) *notata*, var. ; *L.* (*L.*) *semiermis fasta ; L.* (*Dicranomyia*) *agape ; L.* (*D.*) *fijiana ; L.* (*Doaneomyia*) *altitarsis caledoniensis ; L.* (*D.*) *deprivata ; Orimarga* (*Orimarga*) *risbeci ; Helius* (*Helius*) *neocaledonicus ; H.* (*Ideohelius*) *pentaneura ; Epiphragma* (*Epiphragma*) *petulantia ; E.* (*E.*) *legatoria ; Gynoplistia* (*Gynoplistia*) *nigriventris ; Gonomyia* (*Gonomyia*) *herroni ; Gymnastes* (*Paragymnastes*) *dasycera ; G.* (*P.*) *niveipes ; Molophilus* (*Molophilus*) *tartarus; Styringomyia neocaledoniae.*

La Foa.

Approximately 12 miles north and east of La Foa, at Sarranea ; altitudes to 1200 ft. ; December, 1944 ; January, 1945 ; April, 1945. The forested slopes of the eastern branch of the river on the La Foa-Canala Road, on the western slopes of the first mountain range. The river, not listed on official maps, is here termed the La Foa River. It differs from most other streams on the island in being very rich in aquatic plants.

This appears to be nearly as representative of an almost virgin rain forest as can be found on the island. Compared with the others visited it is much larger and offers a wider range in the various associations of semi-tropical deciduous plants. There is no visible coniferous area. The forest appears to have been lightly cut over and incompletely logged out. There are large numbers of huge old trees, some being 90 to 100 ft. tall, towering well above the second growth timber and undergrowth. These trees are covered with ferns while large vines are always present, often extending high into the upper tree branches. There are two fast clear cold streams, each with many brooklets. These streams are permanent and have numbers of beautiful cascades, particularly on the middle and upper forest slopes.

The upper forest canopy is comprised entirely of hard woods of tree species common to the lower mountain forest of the island. On the forest floor are scattered patches of herbaceous plants, together with several species of ferns, including tree ferns. The slopes are steep and quite rocky and many rock seams are exposed where the streams cut the ledges, in some cases forming

narrow gorges. Except during extremely dry spells the forest floor is always wet and spongy.

The fly, *Phacelodocera herroni*, was taken well up the slope in a gorge area. It was resting on low bushes and was a very conspicuous insect. All found were taken in deep woodland, near rock ledges where water was seeping from the rock seams and the forest floor was covered with a thick layer of leaf mould.

Paita.

A forest pocket near the main mountain pass, approximately six miles north of Paita on the north and west slopes of Mont Mou; altitude estimated to be between 1200 and 1400 ft.; area visited at least once a month throughout the entire year.

This pocket differs considerably from the one at La Foa. It covers only a large shelf on the mountain side, dwindling out above, the mountain continuing to ascend as an open barren peak. The forest covers several acres. Its upper canopy is comprised of the same hardwood species as occur at La Foa, but the trees are evidently not as old and the canopy is broken. There is thus a constant growth of herbaceous plants well scattered throughout the entire area, lacking only in the most densely shaded spots. Ferns and tree ferns occur. The permanent stream that drains these woods follows the usual tortuous course, the water always flowing swift and cold. The entire forest floor is one seepage spot after another, and the surface is always soft and muddy. The place is evidently a constant seepage shelf with an ever present water table. Numerous fallen trees indicate that the wet shallow soil is insufficient anchorage against the severe winds.

Tipulidae: *Phacelodocera margaritae; Limonia* (*Limonia*) *hera; L.* (*L.*) *paitae; L.* (*Libnotes*) *semiermis fasta; L.* (*Thrypticomyia*) *basitarsatra; Gymnastes* (*Paragymnastes*) *dasycera; Molophilus* (*Molophilus*) *ordinarius.*

Mont Mou.

Near Paita; altitude 4003 ft.; collections made near the summit 16th December, 1945.

The lower forest strata are generally similar to all other forests of the same level, but appear to be somewhat wetter and more filled with seepage. This type of forest ends at about 1500 ft. but streamers follow the water courses, in some cases to the top levels. Entomologically speaking these are barren, since they are open, relatively dry and virtually impassable due to steepness and tangled growth.

The remainder of the mountain side is covered with a growth of bracken and other purely xerophytic vegetation, including low shrubs and herbage. The mountain top is very narrow, in reality a "hogback," only a few feet in width. The vegetation, similarly xerophytic, may reach a maximum of 20 ft. in height. A saddleback at about 3700 ft. holds some moisture and the area is not greatly different from that at lower altitudes except that tree ferns are lacking. Beginning at this point the peak rises sharply and there is a sudden and complete transition in the forest type. One simply steps from a relatively open forest into a tangled mass of tree trunks. These trees, if in an upright position, would be quite large, but all are practically prostrate. Each

trunk is covered with short moss, interspersed with small ferns to form a queer and motley pattern. In cases this mass of moss and fern may reach a depth of 8 in., beneath the surface being a mass of decomposed vegetation with fine hairlike roots that bind the black wet earth into a solid mass. At this altitude the normal cloud level is below and for a part of each day the peak is clothed in cloud vapours, assuring an abundant and constant moisture supply. The moss absorbs much of this moisture and the great weight thus produced, together with the strong and constant winds, have produced the prostration of the trees.

To get through this tangled mass one must either crawl under or over the trunks, as well as up the slippery ledges. The forest ends as abruptly as it begins, and one comes out onto an open dry forest type that continues down the opposite slope. The temperature of these higher altitudes was notably lower than at the base. Even at noon one could see one's breath. At dusk an extremely heavy dew fell, and in the morning everything was dripping with moisture. The nights were cold and very windy, preceded and followed by clear days.

The TIPULIDAE of the cloud forest were found hiding in the dark damp caverns beneath the tree trunks close to their bases. They usually occurred in groups of three or four, but in one case a small mating swarm was found.

TIPULIDAE : *Limonia* (*Limonia*) *mouicola ; L.* (*Dicranomyia*) *karma ; L.* (*Pseudoglochina*) *microneura ; Helius* (*Helius*) *stolidus ; H.* (*Eurhamphidia*) *mouensis*—all novelties.

SYSTEMATIC TREATMENT.

TIPULINAE.

Macromastix Osten Sacken.

Macromastix Osten Sacken, 1886, *Berlin ent. Z.* **30** : 185.

Macromastix (*Macromastix*) *caledoniana* Alexander.

Macromastix caledoniana Alexander, 1934, *Philip. J. Sci.* **54** : 443-444, pl. 1, fig. 6 (venation).

Ponerihouen, July 7, 1931 (*Risbec*).

Macromastix (*Macromastix*) *cockerellae* Alexander.

Macromastix cockerellae Alexander, 1929, *Encycl. Ent., Diptera* **5** : 85–86, fig. 2 (venation).

Bourail, May 18–26, 1928 (*Cockerell*).

Macromastix (*Macromastix*) *novocaledonica* Alexander.

Macromastix novocaledonica Alexander, 1929, *Encycl. Ent., Diptera* **5** : 83–85, fig. 1 (venation).

Plum Farm, May 30–June 7, 1928 ; Bourail, May 23, 1928. (*Cockerell*). St. Louis, sweeping grassland, May 20, 1945 (*Herron*).

The hypopygium has not been described (fig. 3). Ninth tergite, 9*t*, transverse, the caudal margin very gently emarginate, bordered with very abundant, dense, yellow setae ; back from the margin with numerous long black setae. Outer dististyle, *od*, long-oval, provided with abundant setae, the outer ones few but very strong and powerful. Inner dististyle distinctive, the main body an obtuse knob set with abundant blackened pegs ; rostrum unusually long, with a further concentration of blackened spines at tip.

Macromastix (*Macromastix*) *productifrons* Alexander.

Macromastix (*Macromastix*) *productifrons* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12** : 236–237, pl. 12, fig. 1 (venation).

Nepoui Valley, August, 1940 (*Williams*).

Macromastix (Macromastix) repleta sp. n.

Size relatively small (wing, male, under 10 mm.); antennae elongate, approximately one-half longer than the wing; flagellar segments with three types of bristles, some very long; head and mesonotal praescutum dark brown, pleura yellow; halteres infuscated; legs obscure yellow, the femoral tips more darkened; wings whitish subhyaline; stigma oval, medium brown; sparse macrotrichia on outer wing veins; *r-m* connecting with R_{4+5}; *m-cu* at near midlength of cell 1*st* M_2; abdominal tergites brownish black, with pale yellow posterior borders, sternites and hypopygium chiefly yellow; male hypopygium with the dististyle terminating in a brush of long black setae.

Male.—Length, about 8·5 mm.; wing, 9·5 mm.; antenna, 12 mm. to end of ninth segment.

Frontal prolongation of head whitish yellow, short and small, only about one-third as long as remainder of head, meeting the remainder of front at a right angle. Antennae with scape and pedicel yellow, flagellum brownish black; antennae broken at end of ninth segment, very elongate; flagellar segments long-cylindrical, provided with very long erect setae, additional to the much shorter and stouter verticils and more delicate erect setae. Front testaceous yellow, the broad vertex dark brown.

Pronotum testaceous. Mesonotal praescutum and scutal lobes dark brown, the surface shiny; interspaces with sparse suberect setae; scutellum and postnotum somewhat paler, the latter sparsely pruinose, more darkened along the suture between the mediotergite and pleurotergite; remainder of pleurotergite and the pleura uniformly pale yellow. Halteres infuscated, base of stem narrowly yellow. Legs with the coxae and trochanters yellow; femora obscure yellow, the tips narrowly and weakly more darkened; tibiae obscure brownish yellow, scarcely darker; tarsi yellow, passing into black. Wings (fig. 1) whitish subhyaline, cell *Sc* darker; stigma oval, medium brown; veins brown. Sparse macrotrichia on outer section of R_{4+5}, with fewer on veins M_1 and M_2. Venation: Sc_1 lacking; *Rs* short, arcuated or feebly angulated before midlength; *r-m* connecting with R_{4+5}, the basal section of the latter short; petiole of cell M_1 longer than *m*; *m-cu* in oblique alignment with the basal section of M_3, thus appearing to lie at near midlength of cell 1*st* M_2; cell 2*nd A* moderately broad.

Basal abdominal tergites obscure yellow, succeeding tergites brownish black, with broad pale yellowish posterior borders; sternites yellow, the incisures narrowly and vaguely darker; eighth segment more uniformly blackened; hypopygium chiefly yellow, the tergite infuscated. Male hypopygium (fig. 4) with the tergite, 9*t*, broadly notched, the low lobes with abundant long black setae. Dististyle, *d*, appearing as a flattened scooplike structure that terminates in a group of long black setae; on lower face with a smaller flattened lobe that is provided with a few small spinous setae; outer or convex surface of style with scattered elongate setae, near the tip with a few blackened conical spines.

Holotype, ♂, St. Louis, altitude 1100 ft, November 4, 1945 (*Herron*).

The present fly is most similar to *Macromastix* (*Macromastix*) *risbeci* Alexander, especially in the venation, differing conspicuously in the coloration and in the structure of the antennae and male hypopygium.

Macromastix (*Macromastix*) *risbeci* Alexander.

Macromastix risbeci Alexander, 1934, *Philip. J. Sci.* **54** : 441–443, pl. 1, fig. 5 (venation).

Poindimie, July 13, 1931 (*Risbec*).

Plusiomyia Skuse.

Plusiomyia Skuse, 1890, *Proc. Linn. Soc. N.S.W.* (2) **5** : 86.

Plusiomyia neocaledonica sp. n.

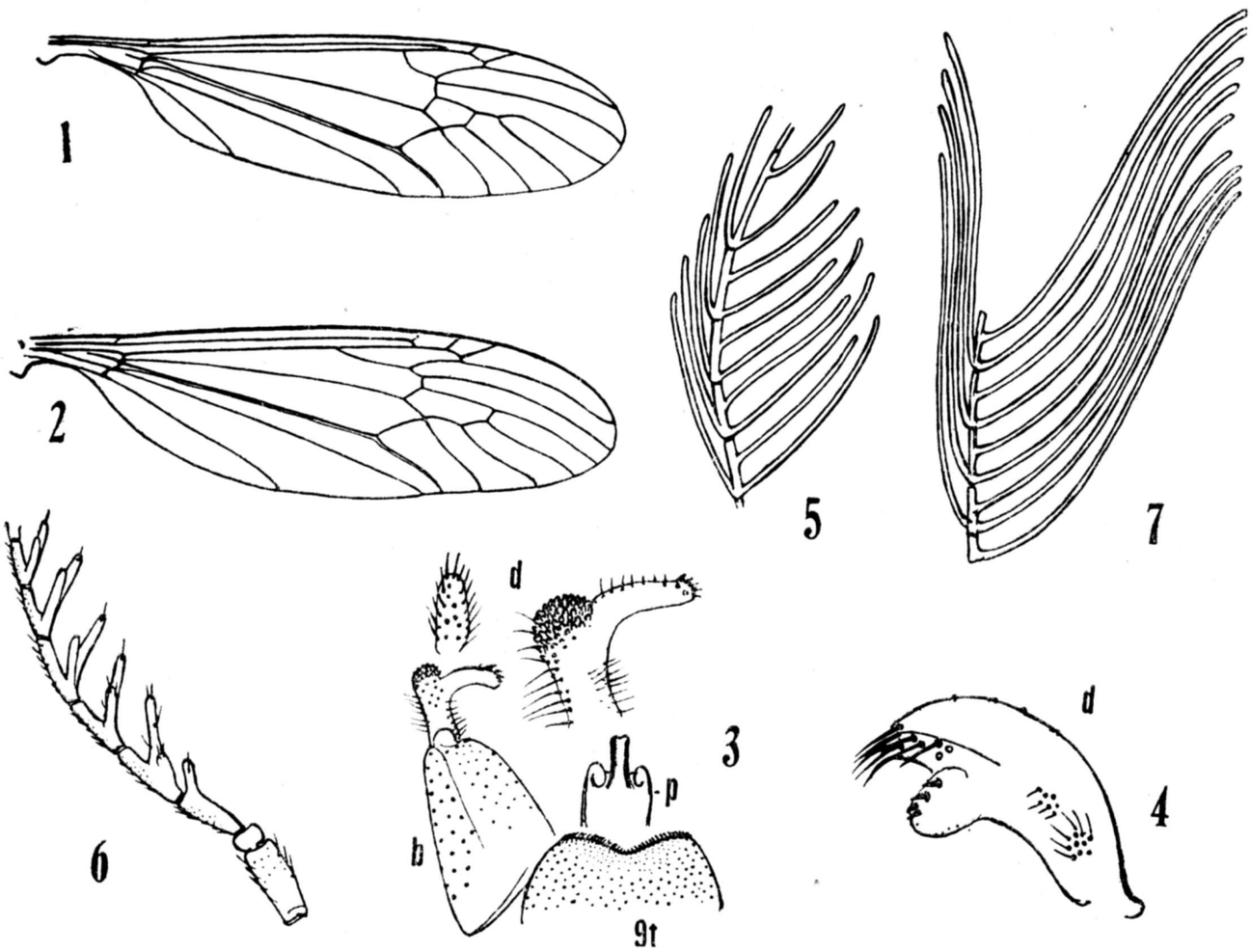
Size medium (wing, male, to 14 mm.); mesonotol praescutum reddish yellow, with four poorly differentiated testaceous yellow stripes, the posterior sclerites of notum darkened; pleura orange-yellow; antennae (male) with the basal six flagellar segments long-tripectinate,

the longest branches about three times the segment itself; wings greyish subhyaline, cells *C* and *Sc* abruptly dark brown; abdominal tergites orange yellow, patterned with black, in male including a subterminal ring; hypopygium black.

Male.—Length, about 14–16 mm.; wing, 12·5–14 mm.

Female.—Length, about 12 mm.; wing, 14 mm.

Frontal prolongation of head a little shorter than the remainder, without nasus, subequal in length to the antennal scape; dark brown and sparsely pruinose above, obscure yellow on sides; palpi black. Antennae of male (fig. 5) with the scape reddish brown, elongate; pedicel brown; flagellum black, including all branches; basal six flagellar segments each with three long branches, the longest approximately four times the segment itself; basal branches approximately equal in length, the outer one a little shorter, the longest nearly three times the segment; antennae of female broken. Head dark plumbeous grey; anterior vertex narrow in both sexes, a little more so in the male, a trifle more than the diameter of scape.



FIGS. 1–7. (TIPULINAE).—1, *Macromastix* (*Macromastix*) *repleta* sp. n.; venation. 2, *Plusiomyia neocaledonica* sp. n.; venation. 3, *Macromastix* (*Macromastix*) *novocaledonica* Alexander; male hypopygium. 4, *Macromastix* (*Macromastix*) *repleta* sp. n.; male hypopygium. 5, *Plusiomyia neocaledonica* sp. n.; antenna of male, flagellar segments 2 to 6, inclusive. 6, *Phacelodocera herroni* sp. n.; antenna of female, basal eight segments. 7, *Phacelodocera herroni* sp. n.; antenna of male, flagellar segments 1 to 5, inclusive.

(Symbols: *b*, basistyle; *d*, dististyle; *p*, phallosome; *t*, tergite.)

Pronotum orange yellow. Mesonotal praescutum reddish yellow with four poorly differentiated testaceous yellow stripes, a trifle more darkened near the suture; scutum and scutellum chiefly dark brown, sparsely pruinose, the mediotergite more heavily so. Pleura and pleurotergite orange yellow, sparsely pruinose behind; dorsopleural membrane paler yellow. Halteres with stem testaceous, knob somewhat darker. Legs with the coxae grey; trochanters obscure yellow; remainder of legs detached, dark brown to black. Wings (fig. 2) greyish subhyaline; prearcular field brown; cells *C* and *Sc* much darker brown, the colour not passing beyond veins *R* and the free tip of Sc_2; veins brownish yellow to light brown, darker in the infuscated portions. Veins beyond cord with complete series of trichia.

Venation : Veins R_3 and R_4 extending parallel to one another for virtually their whole lengths, cell R_2 at margin thus very extensive ; cell M_1 broadly sessile.

Abdominal tergites of male orange yellow, heavily patterned with black, on the basal five tergites appearing as broad lateral stripes, the first tergite and much of the second similarly darkened medially ; basal sternites yellow ; tergites six to eight and sternites seven and eight black, forming a ring ; hypopygium orange. In the female, the tergites more evidently trivittate with black ; restricting the yellow sublateral areas ; sternites yellow ; genital shield orange ; cerci very slender and straight.

Holotype, ♂, St. Louis, altitude 1100–1200 ft., December 30, 1945 (*Herron*). Allotopotype, ♀, November 11, 1945 (*Herron*). Paratopotypes, 2 ♂♂, with the allotype ; 1 ♂, January 22, 1946 (*Herron*).

Among the described species and based upon the structure of the male antennae, the present fly comes closest to *Plusiomyia clarki* Alexander, of Western Australia, which has the flagellar branches somewhat the same. It may be noted that in this genus the branches are commonly two on each segment, the tripectinate condition being much more uncommon. The genus *Plusiomyia* is new to New Caledonia.

Phacelodocera Enderlein.

Phacelodocera Enderlein, 1912, *Zool. Jb.* (*Syst.*) **32** : 26.

Phacelodocera herroni sp. n.

Mesonotal praescutum grey with three poorly indicated brown stripes ; scutellum abruptly obscure yellow, contrasting with the dark parascutella ; wings with the dark pattern relatively pale and inconspicuous, especially in the female ; proximal segments of abdomen light yellow, heavily patterned with brown.

Male.—Length, about 19–27 mm. ; wing, 17–22·5 mm. ; antenna, about 11–15 mm.

Female.—Length, about 27 mm. ; wing, 18 mm. ; antenna, about 4·5 mm.

Frontal prolongation of head relatively long and slender, brownish black, approximately one-half times as long as remainder of head ; palpi short, black. Antennae of male (fig. 7) black throughout, only the scape a trifle paler on proximal portion ; flagellum (male) with branches of unusual length, the longest exceeding half the length of the entire organ ; first flagellar segment short-cylindrical, with a single very long branch ; succeeding segments each with three such elongate branches, two at the extreme base, the third shortly before midlength, on the outermost segments close to midlength ; terminal segment elongate, simple, of approximately the same length and form as the branches ; all branches of approximately equal length and thickness, those of the first segment not much shorter than those of the intermediate segments ; all branches with abundant and conspicuous erect setulae throughout the length ; main axes more glabrous, with scattered, relatively short verticils. In female (fig. 6) antennae 15-segmented, with nine branched segments ; flagellar branches much reduced, as common in the primitive TIPULINAE having branched antennae; first flagellar segment with a single branch, apical in position, nearly one-third as long as the segment ; second segment with a single long branch, subequal to the segment, with an obtuse tubercle at its base, this representing a second branch ; succeeding segments with a comparable basal branch, this becoming progressively longer on the outer segments, reaching its maximum at about the sixth flagellar segment where the longer branch exceeds the segment, the shorter one subequal to the segment ; four outer segments simple, the last about one-fourth longer than the penultimate. Head black, sparsely pruinose ; anterior vertex relatively narrow, somewhat less than the diameter of scape, the eyes correspondingly large.

Mesonotal praescutum grey with three poorly indicated brown stripes ; scutellum abruptly obscure yellow, contrasting with the parascutella ; mediotergite greyish yellow on central portion, the sides broadly dark brown. Pleura with the anepisternum and ventral sternopleurite greyish brown, the dorsal sternopleurite and dorsal anepisternum each with a yellow area. Femora yellow, the tips narrowly and abruptly black ; tibiae and proximal tarsal segments obscure yellow, the outer tarsal segments passing into black. Wings with the pattern relatively pale and inconspicuous, the darker patterns being brownish yellow, with a darker brown area at arculus and at stigma ; cord seamed with darker, including *m-cu*, with more than the proximal half of the basal section of vein *Cu* in cell *M* ; outer medial cells not conspicuously whitened, of the same general colour as the remaining outer

and posterior cells; veins light yellow, darkened in the brown markings. In the female the wings are even more uniformly patterned, suffused with brown, the conspicuous pattern of the male indicated only by a deepening in the colour of the prearcular field and less heavily in the costal area and in cells *R* and *M*, the outer half of the latter vaguely brighter.

Abdomen with the ground colour of the more proximal segments light yellow, the dark pattern heavy, involving the lateral and caudal portions, restricting the ground to sublateral areas; sixth and succeeding segments more uniformly darkened, the hypopygium slightly brighter.

Holotype, ♂, La Foa, in rain forest, April, 1945 (*Herron*). Allotype, ♀, St. Louis, altitude 1200 ft., January 22, 1946 (*Herron*). Paratypes, ♂♀, Mont Mou, February–April, 1947 (*Garrigou*). Paratopotype, 1 ♂, January 14, 1945 (*Herron*); paratypes, 4 ♂, with the allotype, December 30, 1945, January 22, 1946 (*Herron*); 12 ♂, Mont Mou, altitude 900 ft., February, 1947 (*Garrigou*).

The discovery of two distinct new species of *Phacelodocera* in New Caledonia was entirely unexpected. The only other Australasian form is *Phacelodocera tasmaniensis* Alexander, of Tasmania, with much shorter antennal branches than either of the two species described at this time. I take unusual pleasure in dedicating this outstanding fly to its discoverer, Mr. John C. Herron.

In various recent papers I have called attention to the fact that several of our proposed genera in the primitive TIPULINAE have been founded on relatively slight differences in the venation and in the structure of the male antennae. It seems certain that some of these names will fall as synonyms while others may be retained as valid subgenera. Thus *Ptilogyna* Westwood, 1835, and *Phacelodocera* Enderlein, 1912, are separable only by the absence or presence of the *r–m* crossvein in the two groups. *Ozodicera* Macquart, 1834, *Plusiomyia* Skuse, 1890, and *Platyphasia* Skuse, 1890, are similarly all very nearly allied but may be retained as valid subgeneric groups. Still others, including *Macromastix* Osten Sacken, 1886, *Longurio* Loew, 1869, and *Tanypremna* Osten Sacken, 1886, are more distantly related, but all have the same general type of structure of the male hypopygium and seem separable from the present and allied groups with branched antennae only by minor differences. The oldest generic name applicable to this particular group of primitive TIPULINAE is *Megistocera* Wiedemann, 1828, with *Ctenogyna* Macquart, 1838, and *Leptotarsus* Guerin, 1830, somewhat later.

Phacelodocera margaritae sp. n.

Mesonotal praescutum with three conspicuous orange-yellow stripes, the scutum and scutellum uniformly dark brown, only the praescutella paler; postnotum yellow with a sparse grey pruinosity; dorsal pleurites dark brown, the ventral ones, with the sternites, yellow, sparsely pruinose; wings whitish subhyaline with a conspicuous contrasting dark brown pattern, the pale post-stigmal area broad and complete.

Male.—Length, about 27 mm.; wing, 22·5 mm.; antenna, about 14 mm., the longest branch about 7·5 mm.

Characters much as in *herroni*, differing conspicuously in the diagnostic features above listed. Pronotum brownish black. Mesonotal praescutum with three orange-yellow stripes, the broad interspaces light grey; humeral region of praescutum very restrictedly blackened; scutum and scutellum dark brown, the parascutella paler, obscure yellow; mediotergite yellow, with a sparse grey pruinosity; pleurotergite more pruinose, especially the elevated katapleurotergite. Pleura with the dorsal half chiefly dark brown, including the dorsopleural membrane and a broad stripe over the dorsal pleurites; a single yellow spot on extreme dorsal portion of the anepsternum; ventral pleurites and sternum yellow, the former more pruinose, the latter clear yellow. Halteres brownish black, the base of stem restrictedly paler. Legs with the coxae pale, light grey pruinose; trochanters brownish yellow; femora obscure yellow, the tips black; tibiae and tarsi brownish black. Wings relatively broad,

whitish subhyaline, with a conspicuous contrasting dark brown pattern which includes the broad costal border, involving the prearcular field and cells *C*, *Sc*, *R* and R_1, with the basal half of *M*; cell *Sc* and cephalic portion of the radial cells somewhat brighter in colour than cell *Sc*; outer radial field similarly darkened, including more than the outer half of cells R_2 and R_3; narrow brown seams along veins *Cu*, *m-cu*, the cord and outer end of cell *1st* M_2, all connected with the major darkenings described; a more greyish brown wash along posterior wing border, involving cell M_4 and the broad outer portions of cells *Cu* to *2nd A* inclusive; remainder of ground whitish subhyaline, the broad post-stigmal band somewhat more yellowish; veins brown, yellow in the whitened portions. Venation: *Rs* relatively long, subequal in length to R_{2+3}; cell M_1 narrowly sessile; *m-cu* at fork of M_{3+4}.

Abdomen relatively long, obscure brownish yellow, the tergites with a blackened lateral stripe; posterior borders of segments narrowly infuscated; outer segments, including hypopygium, more uniformly dark brown.

Holotype, ♂, Paita, in rain forest, April 8, 1945 (*Herron*). Paratypes, ♂, Mont Mou, altitude 500–900 ft., March–April, 1947 (*Garrigou*).

This beautiful fly is affectionately dedicated to Mrs. Charles P. Alexander (Mabel Marguerite Alexander), as a further token of appreciation for constant aid and encouragement in my study of the TIPULIDAE. The species is very different from *Phacelodocera herroni* sp. n., especially in all details of coloration of the wings, thorax and abdomen.

LIMONIINAE.

Limoniini.

Limonia Meigen.

Limonia Meigen, 1803, *Illiger's Mag.* **2** : 262.
Limnobia Meigen, 1818, *Syst. Beschr. zweifl. Ins.* **1** : 116.

Limonia (Limonia) mouicola sp. n.

General coloration of mesonotum chestnut brown, restrictedly patterned with darker; anterior vertex grey; legs black; wings with a weak brownish tinge, stigma oval, darker brown; Sc_1 ending about opposite two-fifths to one-half the lengths of *Rs*, *m-cu* at fork of *M*; male hypopygium with the tergite large, its caudal border with a scarcely evident median emargination; ventromesal lobe of basistyle with a small lobule on face; rostral prolongation of ventral dististyle triangular in outline, the two straight spines placed at and just below summit of outer angle.

Male.—Length, about 4·3–4·5 mm.; wing, 4·5–5 mm.

Rostrum bright yellow; palpi dark brown. Antennae with scape and pedicel yellow, flagellum broken. Head light grey on anterior vertex, darker behind, obscure yellow beneath; anterior vertex moderately wide, exceeding twice the diameter of scape.

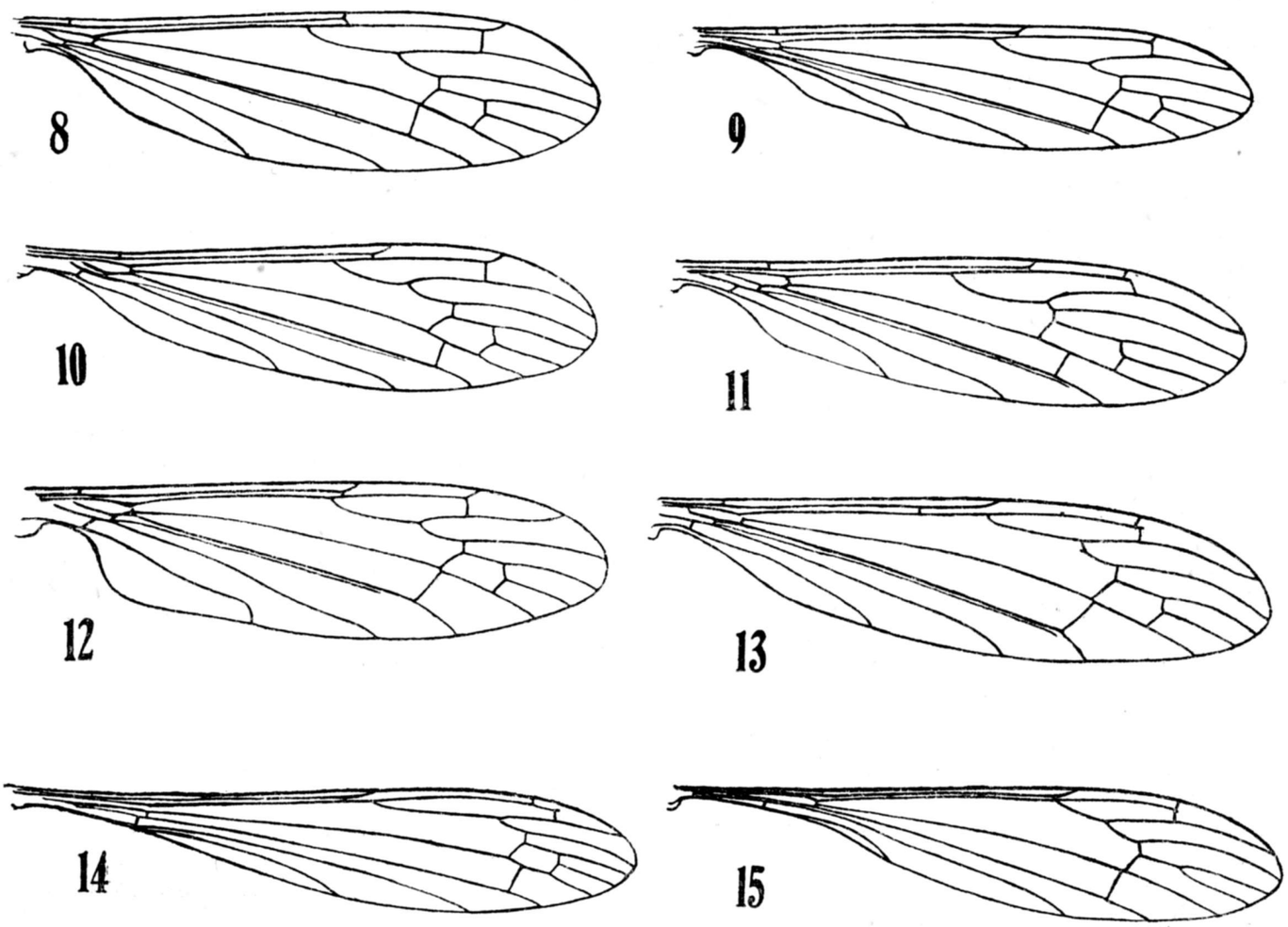
Pronotum infuscated, the scutellum obscure yellow. Mesonotal praescutum with the stripes chestnut brown, very narrowly bordered by brown, including a more or less distinct median vitta; posterior sclerites of notum somewhat similarly patterned and variegated, chiefly chestnut brown, with a median dark line; mediotergite with the cephalic half more uniformly infuscated, the posterior portion obscure yellow, with a delicate central dark vitta; pleurotergite yellow. Pleura yellow. Halteres brownish black, the base of stem very restrictedly yellow. Legs with coxae and trochanters yellow, the fore coxae weakly infuscated; remainder of legs black, the femoral bases, especially of the fore legs, restrictedly obscure yellow. Wings (fig. 8) with a weak brownish tinge; stigma oval, darker brown; veins dark brown. Venation: Sc_1 ending about opposite two-fifths to one-half the length of *Rs*, Sc_2 at its tip; basal section of R_{4+5} about two-fifths *Rs*; cell *1st* M_2 subequal in length to or shorter than M_4; *m-cu* at the fork of *M*.

Abdominal tergites and hypopygium brownish black; sternites obscure yellow. Male hypopygium (fig. 16) with the tergite, *9t*, large, its caudal margin rounded with a scarcely evident median emargination; posterior border more or less thickened, on either side with about six or seven strong setae, more concentrated on outer portion of each lobe, the disk without setae. Basistyle, *b*, with ventromesal lobe obtuse, provided with long conspicuous pale setae; on face of lobe with a small darkened lobule. Dorsal dististyle nearly straight, its apex suddenly narrowed into a slender recurved spine. Ventral dististyle, *vd*, large and fleshy, the total area about one-third greater than that of the basistyle; rostral prolongation

more or less triangular in outline, with the two spines placed at and below the summit of the outer angle ; spines subequal or the terminal one a trifle shorter, both slender. Gonapophysis, *g*, produced directly caudad into the apical lobe, this narrowed very gradually to the obtuse tip. Aedeagus bilobed at apex.

Holotype, ♂, Mont Mou, altitude 4000 ft., December 16, 1945 (*Herron*). Paratopotypes, 3 ♂ ; in a small swarm, as noted earlier (Mont Mou, general account).

The present fly has no close regional ally. In coloration and pattern of the mesonotum it slightly resembles *Limonia* (*Dicranomyia*) *karma* sp. n., but is entirely distinct. It should be noted that the subgeneric assignment is



FIGS. 8–15 (LIMONIINI ; genus *Limonia*, venation).—8, *Limonia* (*Limonia*) *mouicola* sp. n. 9, *Limonia* (*Limonia*) *hera* sp. n. 10, *Limonia* (*Limonia*) *paitae* sp. n. 11, *Limonia* (*Libnotes*) *semiermis fasta* subsp. n. 12, *Limonia* (*Dicranomyia*) *agape* sp. n. 13, *Limonia* (*Dicranomyia*) *karma* sp. n. 14, *Limonia* (*Thrypticomyia*) *basitarsatra* sp. n. 15, *Limonia* (*Pseudoglochina*) *microneura* sp. n.

solely on the basis of wing venation since the structure of the male hypopygium is quite as in *Dicranomyia* and allied groups. The strict limits of several supposed subgeneric groups in *Limonia* break down in this faunal region.

Limonia (Limonia) hera sp. n.

Size small (wing, male, 5 mm.) ; general coloration of thorax pale yellow, the central portion of mesonotum weakly more darkened ; head grey, the anterior vertex reduced to a very narrow strip ; legs brown ; wings with a weak brownish tinge, stigma pale brown; Sc_1 ending just beyond one-third the length of *Rs* ; male hypopygium with the caudal margin of tergite with a very deep and narrow median notch, the lateral lobes very long, each with two or three elongate setae ; dististyle oval, gradually narrowed into the elongate rostrum ;

gonapophysis with the mesal-apical lobe expanded into a weak blade ; aedeagus terminating in two divergent lobes or flaps.

Male.—Length, about 4·5 mm. ; wing, 5 mm.

Rostrum short, light yellow ; palpi pale. Antennae with scape yellow, pedicel a little darker ; flagellum broken. Head light grey, the central portion of vertex restrictedly patterned with brown ; anterior vertex reduced to a linear strip that is only about as wide as a single row of ommatidia.

Pronotum pale yellow. Mesonotum yellow, the central portion weakly more infuscated, beginning as a median praescutal stripe at near mid-length of the sclerite, expanded over the whole central portion of scutum, including also the scutellum and postnotum. Pleura and pleuro-tergite yellow. Halteres with stem testaceous, knob infuscated. Legs with coxae and trochanters pale yellow ; remainder of legs brown, the femoral bases restrictedly paler ; terminal tarsal segments broken. Wings (fig. 9) with a weak brownish tinge, the prearcular and costal fields more whitened ; stigma oval, pale brown, only slightly darker than the ground ; veins brown. Venation : *Sc* moderately long, Sc_1 ending just beyond one-third the length of *Rs*, Sc_2 a short distance from its tip ; *Rs* weakly angulated at origin ; free tip of Sc_2 and R_2 pale, in transverse alignment ; cell 1*st* M_2 a little longer than vein M_4 ; *m-cu* close to fork of *M* ; anal veins slightly convergent at about one-third the length of vein 2*nd A*.

Abdominal tergites dark brown, sternites yellow ; hypopygium chiefly pale. Male hypopygium (fig. 17) with the tergites, 9*t*, narrowed apically, the caudal margin with a very deep and narrow median notch, each lateral lobe a little broader, obtuse at tip, each with two or three long setae ; a few other setae on lateral portions of tergite. Basistyle, *b*, with the ventromesal lobe very low and inconspicuous, with abundant setae. Dististyle, *d*, with the body small, produced directly into the long gently curved more sclerotized rostral prolongation, the tip narrowed and acute ; no rostral spines. Gonapophysis, *g*, with mesal-apical lobe long and conspicuous, the outer half slightly more expanded into a weak blade. Aedeagus, *a*, at tip produced into two divergent glabrous lobes or flaps.

Holotype, ♂, Paita, September 16, 1945 (*Herron*). Paratype, ♂, St. Louis, altitude 1200 ft., October 20, 1945 (*Herron*).

The nearest described allies of the present species include *Limonia* (*Limonia*) *elephantina* Alexander, of the Caroline Islands, and *L.* (*L.*) *hebridicola* Alexander, of New Hebrides. These differ very evidently in the structure of the male hypopygium, particularly the ninth tergite and gonapophyses.

Limonia (**Limonia**) **paitae** sp. n.

General coloration black, restrictedly patterned with yellow ; rostrum and antennae black ; mesonotal praescutum with an obscure yellow median stripe ; thoracic pleura black, conspicuously striped with yellow ; legs brownish black, claws nearly straight ; wings with a dusky tinge ; stigma dark brown, preceded and followed by more whitened areas ; Sc_1 ending about opposite four-fifths to five-sixths *Rs* ; *m-cu* from one-half to two-thirds its length beyond the fork of *M*.

Female.—Length, about 5 mm. ; wing, 5 mm.

Rostrum and palpi black. Antennae brownish black throughout ; flagellar segments oval. Head grey ; anterior vertex reduced, a little narrower than the diameter of scape.

Pronotum in front black, the scutellum and pretergites abruptly yellow, continued backward over the extreme border of praescutum and the dorsopleural region as a narrow line. Mesonotum black, with a conspicuous obscure yellow median praescutal stripe that is not quite continuous, being obscured at cephalic margin and again before the suture ; median region of scutum similarly obscure yellow. Pleura black, with a conspicuous ventral pale stripe extending from behind the fore coxae to the base of abdomen ; ventral sternopleurite slightly paler than the dorsal stripe. Halteres blackened, the base of stem narrowly yellow. Legs with the coxae yellow, the middle pair restrictedly more darkened at base ; trochanters obscure yellow ; remainder of legs brownish black ; claws nearly straight. Wings (fig. 10) with a dusky tinge ; stigma short-oval, dark brown, conspicuous, preceded and followed by more whitish areas ; veins brown. Venation : *Sc* relatively long, Sc_1 ending about opposite four-fifths to five-sixths the length of *Rs*, Sc_2 a short distance from its tip, about opposite three-fifths the length of *Rs* ; free tip of Sc_2 lying a little beyond level of R_2 ; *m-cu* about one-half to two-thirds its length beyond the fork of *M* ; anal veins nearly parallel to one another.

Abdomen brownish black ; valves of ovipositor horn-yellow, the last sternite pale ; cerci very slender, gently upcurved to the acute tips.

Holotype, ♀, Paita, September 16, 1945 (*Herron*).

Limonia (*Limonia*) *paitae* is quite different from other regional members of the subgenus, including *L.* (*L.*) *hera* sp. n., differing especially in the coloration of the body and wings and in the venation. In this latter regard, the distal position of *m–cu* is suggestive of *L.* (*L.*) *distivena* Alexander, of New Britain, an otherwise entirely different fly.

Limonia (*Libnotes*) *notata* (van der Wulp), var.

Libnotes notata van der Wulp, 1878, *Tijds. Ent.* **21** : 194, pl. 12, fig. 5.

Thi Valley, November 8, 1940 (*Williams*). St. Louis, altitude 1200 ft., January 22, 1946 (*Herron*). Near La Foa, February 11–26, 1945, April 25, 1945 (*Remington*).

Limonia (Libnotes) semiermis fasta subsp. n.

Very similar to the typical form (Eastern Australia), differing in slight differences in venation and structure of the hypopygium.

Male.—Length, about 5·5 mm.; wing, 6 mm.

Female.—Length, about 6·5 mm.; wing, 6 mm.

Wings (fig. 11) with a faint greyish tinge, restrictedly patterned with pale brown, the oval stigma a little darker brown; the slightly paler brown pattern includes cells *C* and *Sc*, origin of *Rs*, cord and outer end of cell 1*st* M_2, with weak washes nearer the wing base; prearcular field slightly yellowed; veins brown, more brownish yellow in the brightest portions. Venation: *Sc* long, Sc_1 ending nearly opposite or only a short distance before the level of the fork of *Rs*, Sc_2 a short distance from its tip, a little more so in male than in female; free tip of Sc_2 and R_2 in transverse alignment or with the latter a little more distad (as figured); *Rs* arcuated; *m-cu* nearly its own length beyond the fork of *M*; vein 2*nd A* nearly straight and parallel to 1*st A*.

Male hypopygium (fig. 18) with the caudal margin of ninth tergite, 9*t*, shallowly notched, the lobes broadly rounded, with strong marginal setae. Basistyle, *b*, with the ventromesal lobe very long and conspicuous, considerably exceeding the style itself; base with a group of four very long yellow setae; more distad still further strong setae that are shorter than the basal set; apex of lobe with closest parallel ridges to produce a roughened appearance. Dorsal dististyle a very small spine. Ventral dististyle, *vd*, large and fleshy, on outer margin with a strong toothlike point or lobe; rostral portion beyond this spine blackened and scabrous. Gonapophysis, *g*, appearing as a long swordlike blade, with a strong lateral tooth.

Holotype, ♂, St. Louis, altitude 1200 ft., October 20, 1945 (*Herron*). Allotype, ♀, Paita, September 16, 1945 (*Herron*).

Limonia (Dicranomyia) agape sp. n.

General coloration black, pruinose; halteres yellow; femora obscure yellow, with a moderately broad black subterminal ring; wings whitish subhyaline, with a clouded pattern of brown and brownish grey; Sc_1 ending about opposite one-fourth the length of *Rs*; inner end of cell R_3 lying far proximad of the other elements of the cord; *m-cu* close to the fork of *M*.

Female.—Length, about 6 mm.; wing, 6·3 mm.

Rostrum and palpi dark brown. Antennae with scape and pedicel black; remainder broken. Head grey; anterior vertex narrow, less than the diameter of scape.

Mesonotum chiefly black, sparsely pruinose with grey, the humeral region of praescutum more reddened. Pleura brownish black, pruinose. Halteres yellow. Legs with the coxae and trochanters yellowish testaceous; femora obscure yellow, with a moderately broad black ring that is nearly terminal in position, being nearly four times as wide as the actual pale apex; tibiae yellow, the tips very narrowly and vaguely darker; proximal tarsal segments obscure yellow, the outer ones passing into black. Wings (fig. 12) relatively broad, the petiole short; whitish subhyaline, variegated by brown and brownish grey clouds; more than the proximal half of cells *C* and *Sc* infuscated; darker brown areas including the stigma and a common spot over fork of *Sc* and origin of *Rs*; paler washes over cord, outer end of cell 1*st* M_2, at end of vein R_3 near outer end of this cell, at arculus and at one-third

the length of cell *R*; conspicuous washes in cells *M*, *Cu*, 1*st A* and 2*nd A*, the cells beyond cord chiefly clear; a linear dark wash in centre of cell R_1; prearcular field whitened; veins brown, the outer half of *C* conspicuously yellow. Venation: Sc_1 ending about opposite one-fourth the length of *Rs*, Sc_2 a short distance from its tip; free tip of Sc_2 and R_2 in approximate transverse alignment; inner end of cell R_3 lying proximad of other elements of cord; *m-cu* close to fork of *M*; vein 2*nd A* bent into wing margin at a right angle, the cell wide.

Abdominal tergites brown, sternites yellow, the lateral borders narrowly dark brown; genital shield yellow; valves of ovipositor reddish horn colour; hypovalvae blackened at bases; cerci long and slender, gently upcurved.

Holotype, ♀, St. Louis, altitude 1200 ft., January 22, 1946 (*Herron*).

I am referring this attractive fly to the group that includes the Australian *Limonia* (*Dicranomyia*) *idonea* Alexander and *L.* (*D.*) *saxatilis* (Skuse), from which species it differs conspicuously in coloration and venation. The members of this group have much in common with the subgenus *Limonia* Meigen and the strict subgeneric assignment must be held in question.

Limonia (*Dicranomyia*) *fijiana* (Alexander).

Dicranomyia fijiana Alexander, 1924, *Ann. Mag. nat. Hist.* (9) **13**: 36–37.

St. Louis, altitude 1200 ft., November 11, 1945 (*Herron*); Mont Chapeau Gendarme, St. Louis, October 7, 1944 (*Herron*); Mont Mou, altitude 900 ft., February, 1947 (*Garrigou*).

Some of these specimens have a few dark spots in cell *C*, but others have this area unpatterned, as in the type. The male hypopygia of these two types are so similar that it seems inadvisable to attempt to separate them despite the colorational difference indicated.

Limonia (*Dicranomyia*) *illingworthi* (Alexander).

Dicranomyia illingworthi Alexander, 1914, *Ann. ent. Soc. Amer.* **7**: 239–240, fig. 1 (venation), fig. 7 (male hypopygium).

Dicranomyia illingworthi Alexander, 1928, *Encycl. Ent., Diptera* **5**: 89–90, fig. 8 (male hypopygium).

Noumea, May 16, 1928 (*Cockerell*); Bourail, May 27, 1928 (*Cockerell*). Noumea, July 6–August 23, 1940; St. Louis, 1940 (*Williams*).

Limonia (Dicranomyia) karma sp. n.

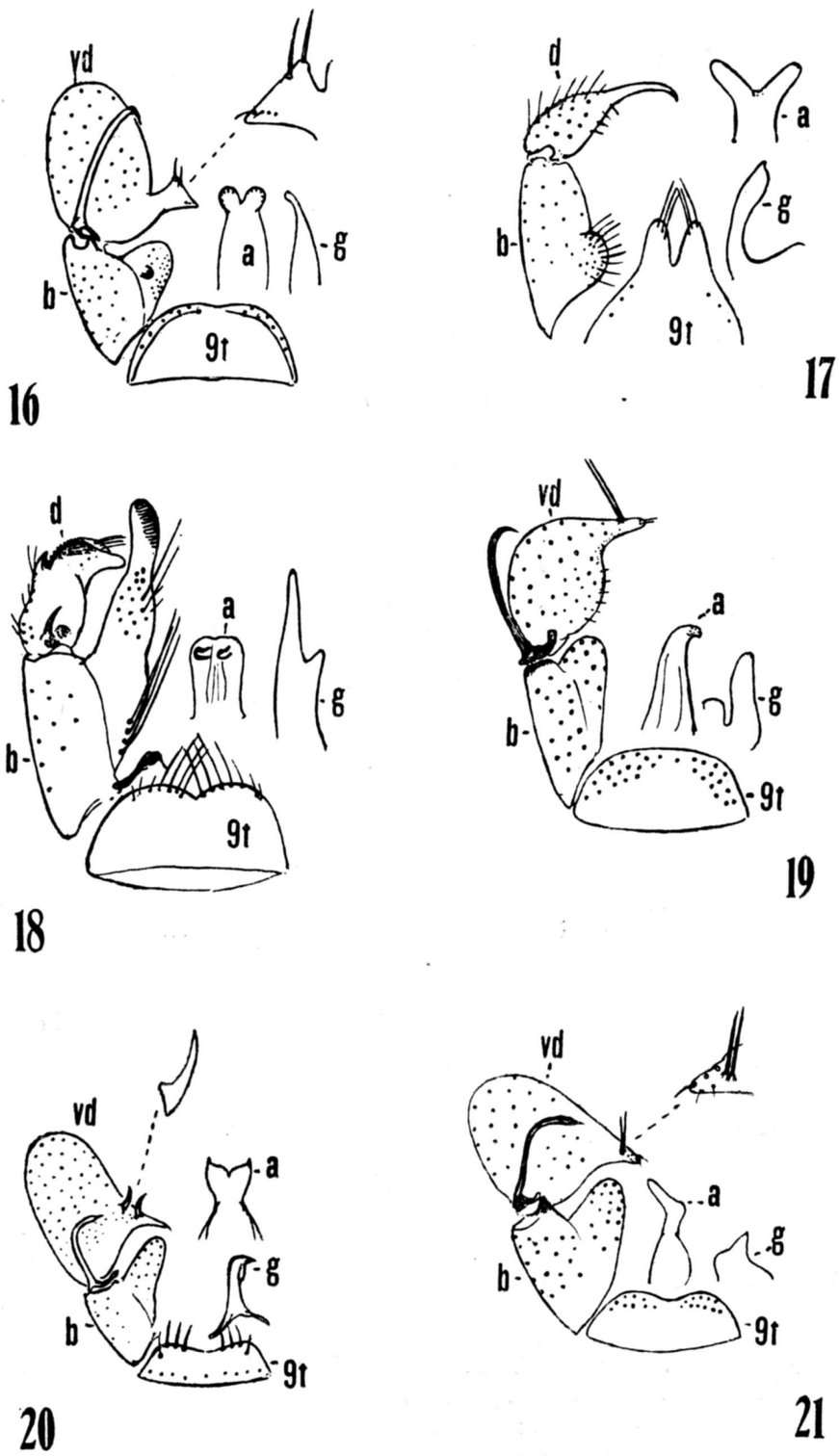
Small size (wing, male, 5·5 mm.); general coloration of mesonotum reddish brown restrictedly patterned with darker; antennae (male) elongate, exceeding one-half the length of wing; flagellar segments long-cylindrical, clothed with abundant long coarse setae; legs black; wings with a very strong blackish tinge; *Sc* ending opposite origin of *Rs*, Sc_1 very long; *m-cu* close to fork of *M*; male hypopygium with the tergite large, the posterior border convexly rounded; rostral spines two, very long, straight.

Male.—Length, about 5 mm.; wing, 5·5 mm.; antenna, about 3·5 mm.

Rostrum obscure yellow, darker at apex; palpi brownish black. Antennae with scape and pedicel obscure yellow, flagellum black; antennae elongate, exceeding one-half the length of wing; flagellar segments long-cylindrical, with abundant erect coarse setae scattered throughout the length, these bristles dark-coloured and about three times the diameter of segment. Front obscure yellow; posterior portion of head brownish black; anterior vertex broad.

Pronotum dark, the lateral portions of the pretergite obscure yellow. Mesonotal praescutum reddish brown, with indications of a very narrow darker brown median stripe; posterior sclerites of notum slightly darker, the scutal lobes vaguely patterned with darker; mediotergite with indications of a narrow darker central line. Pleura and pleurotergite yellow, the dorsal mesepisternum and dorsopleural region somewhat more infuscated. Halteres with stem black, knobs broken. Legs with the coxae and trochanters yellowish testaceous; remainder of legs black; claws small and apparently untoothed. Wings

(fig. 13) with a very strong blackish tinge, the stigma only a trifle darker; cells *C* and *Sc* weakly more darkened: veins brown. Venation: *Sc* short, Sc_1 ending opposite origin of *Rs*, Sc_2 far from its tip, Sc_1 alone about five-sixths *Rs*, the latter slightly angulated near origin; free tip of Sc_2 and R_2 both pale, the latter slightly less than its own length beyond the former; a weak spur of vein R_{1+2} beyond R_2; basal section of R_{4+5} weakly angulated and spurred at near one-third the length; cell 1*st* M_2 nearly as long as the distal section of vein M_3; *m-cu* close to fork of *M*, longer than the distal section of Cu_1; vein 2*nd A* gently convex, slightly narrowing cell 1*st A* near its origin.



FIGS. 16–21 (LIMONIINI; genus *Limonia*, male hypopygia).—16, *Limonia* (*Limonia*) *mouicola* sp. n. 17, *Limonia* (*Limonia*) *hera* sp. n. 18, *Limonia* (*Libnotes*) *semiermis fasta* subsp. n. 19, *Limonia* (*Dicranomyia*) *karma* sp. n. 20, *Limonia* (*Thrypticomyia*) *basitarsatra* sp. n. 21, *Limonia* (*Pseudoglochina*) *microneura* sp. n.

(Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *t*, tergite; *vd*, ventral dististyle.)

Abdomen, including hypopygium, brownish black. Male hypopygium (fig. 19) with the tergite, 9*t*, transverse, large, the posterior border convexly rounded, without lobes, the central portion more nearly truncate. Basistyle, *b*, with the ventro-mesal lobe large and fleshy, obtusely rounded at tip, provided with long coarse setae. Dorsal dististyle a slender rod, on outer half gently curved and gradually narrowed to the acute tip. Ventral dististyle, *vd*, of moderate size, its area subequal to or a trifle less than that of the basistyle, gradually produced into the rostrum; rostral spines two, placed close together on very small basal tubercles; spines elongate, subequal to the entire length of the prolongation. Gonapophysis, *g*, with mesal-apical lobe pale, flattened, the tip obtuse.

Holotype, ♂, Mont Mou, altitude 4000 ft., December 16, 1945 (*Herron*).

Limonia (*Dicranomyia*) *karma* is entirely distinct from all other described species of the subgenus, differing very evidently in the elongate antennae of the male sex, a very unusual character in the entire genus *Limonia*.

Limonia (*Idioglochina*) *tusitala novocaledonica* Alexander.

Limonia (*Idioglochina*) *novocaledonica* Alexander, 1929, *Encycl. Ent., Diptera*, **5** : 90–91.

Nakety, on sea reef, October 9, 1940 (*Williams*). Ngo Bay, at light, May 14, 1928 (*Cockerell*). Five miles south of Ponerihouen, March 24, 1945, on beach (*Remington*); No. 9.

Limonia (*Geranomyia*) *circipunctata* (Brunetti).

Geranomyia circipunctata Brunetti, 1912, *Fauna British India, Dipt. Nematocera* : 390.

Limonia (*Geranomyia*) *circipunctata* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12** : 237–238.

Noumea, August 23, 1940, at light (*Williams*).

Limonia (*Geranomyia*) *conjuratoides* Alexander.

Limonia (*Geranomyia*) *conjuratoides* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12**: 238–239, pl. 12, fig. 2 (venation), fig. 7 (male hypopygium).

Noumea, August 23, 1940 (*Williams*). Seven miles south-east of La Foa, March 18, 1945 (*Remington*); No. 1.

Limonia (*Thrypticomyia*) *subsaltens* (Alexander).

Dicranomyia (*Thrypticomyia*) *subsaltens* Alexander, 1924, *Ann. Mag. nat. Hist.* (9) **13** : 34–35.

Thrypticomyia subsaltens Edwards, 1928, *Ins. Samoa, Nematocera* 6, fasc. **2** : 77.

Limonia (*Thrypticomyia*) *subsaltens* Alexander, 1929, *Encycl. Ent., Diptera* **5** : 88.

Plum Farm, June 7, 1928 (*Cockerell*). Noumea, August 29, 1940 (*Williams*).

Limonia (**Thrypticomyia**) **basitarsatra** sp. n.

General coloration of mesonotum almost uniformly brown, the postnotum and pleura yellow; legs, including the basitarsi, black, the outer tarsal segments white; wings with a weak brownish tinge, the long-oval stigma darker brown; vein R_1 long, subequal to *m-cu*; male hypopygium with the tergite transverse, the caudal border very shallowly emarginate, each low lobe with three strong marginal setae; apical points of the aedaegus short.

Male.—Length, about 5·5–5·8 mm.; wing, 5·5–6 mm.

Female.—Length, about 4·5 mm.; wing, 6 mm.

Rostrum brownish yellow; palpi with basal segments yellow, the outer two brownish black. Antennae black. Head dark brown.

Mesonotum almost uniformly brown, the central area of the praescutum somewhat darker, the lateral borders slightly more reddened; postnotum and pleura yellow. Halteres elongate, stem brown, knobs darker brown. Legs with the coxae and trochanters yellow; femora, tibiae and basitarsi black, the outer tarsal segments whitened. Wings (fig. 14) with a weak brownish tinge, the long-oval stigma darker brown; prearcular field more

whitened; veins brown. Venation: Sc_1 ending opposite or just beyond origin of *Rs*, Sc_2 some distance from its tip, Sc_1 alone exceeding *m-cu*; free tip of Sc_2 some distance before level of R_2, vein R_1 alone subequal to or slightly longer than *m-cu*; *m-cu* about one-half to fully its own length beyond the fork of *M*.

Abdomen, including hypopygium, brownish black; sternites vaguely more brightened. Male hypopygium (fig. 20) with the tergite, 9*t*, transverse, the caudal border with a very shallow emargination to virtually truncate; posterior border of either lobe with three very strong but otherwise unmodified setae. Basistyle, *b*, with the ventromesal lobe long, simple, without special vestiture. Ventral dististyle, *vd*, approximately three times as extensive as the basistyle; rostral prolongation relatively slender, spines two, slightly unequal, appearing as gently curved pale horns from scarcely developed tubercles. Gonapophysis, *g*, with mesal-apical lobe erect, narrow, at apex directed laterad into a small spinous point, the margin back from this point with a low flange. Aedeagus, *a*, with the apical points relatively short.

Holotype, ♂, Paita, September 16, 1945 (*Herron*). Allotopotype, ♀, pinned with type. Paratopotypes, 1 ♂, pinned with type; four additional specimens in poor condition.

The present species is most similar to *Limonia* (*Thrypticomyia*) *doddi* (Alexander), which differs in all details of structure of the male hypopygium, including the long acute apical spines of the aedeagus. The present fly differs from all known species of the subgenus in the uniformly blackened basitarsi.

Limonia (**Pseudoglochina**) **microneura** sp. n.

Size relatively large (wing, male, over 7 mm.); tibia chiefly brownish black, the base and apex narrowly white; wings with a faint dusky tinge, stigma dark brown; *Rs* and basal section of R_{4+5} in gently oblique alignment, subequal in length; vein 2*nd A* very short, the cell correspondingly small and narrow.

Male.—Length, about 6 mm.; wing, 7·2 mm.

Rostrum and the reduced palpi yellow. Antennae with the scape and pedicel dark brown, flagellum broken. Front testaceous yellow, posterior portion of head dark brown, the occipital portion more reddened; anterior vertex relatively wide.

Pronotum dark brown medially, paling into yellow on sides. Mesonotal praescutum with four reddish yellow stripes, the lateral border paling to darker yellow; a capillary dark brown median vitta; scutal lobes similar, reddish yellow, the broad median area and the adjacent portion of the praescutum brown; scutellum testaceous, with a pale brown central spot; mediotergite yellow. Pleura and pleurotergite yellow, the propleura and ventral sternopleurite more darkened. Halteres elongate, brownish black throughout. Legs with the coxae yellow, the fore pair short; trochanters yellow; femora brown, obscure yellow basally, the tips still darker brown; tibiae brownish black, the base and very slightly narrower apex snowy-white, either including about one-eighth to one-ninth of the segment; tarsi white. Wings (fig. 15) with a faint dusky tinge, the small short-oval stigma dark brown; veins dark brown. Venation: Sc_1 ending about opposite one-third the length of *Rs*, Sc_2 approximately at origin of the latter; free tip of Sc_2 and R_2 in virtual transverse alignment, R_2 jutting beyond as a short spur; *Rs* and basal section of R_4 F_5 subequal in length, gently oblique; cell 2*nd* M_2 about one-half longer than its petiole; *m-cu* close to fork of *M*; vein 2*nd A* very short, the cell correspondingly narrow.

Abdominal tergites brown, the sternites yellow, the more distal ones a trifle infuscated; hypopygium pale brown. Male hypopygium (fig. 21) with the ninth tergite, 9*t*, narrowed outwardly, the posterior border with a shallow notch, the lateral lobes correspondingly low, with numerous setae. Basistyle, *b*, with the ventromesal lobe large but simple, its total area only a little less than the style itself. Dorsal dististyle a slender very strongly curved hook, the tip abruptly narrowed into a straight spine. Ventral dististyle, *vd*, fleshy, its total area greater than that of the basistyle; rostral spines two, placed at or below the middle of the height and at near midlength of the prolongation; spines placed close together, subequal in size, straight and dark-coloured. Gonapophysis, *g*, with mesal-apical lobe stout, produced into a triangular point.

Holotype, ♂, Mont Mou, altitude 4000 ft., December 16, 1945 (*Herron*).

This fly is readily told by the coloration of the legs, especially the tibiae, and by the venation. The unusually small cell 2*nd A* represents the extreme

reduction so far found in this subgenus and thus still further approaches the condition found in the subgenus *Doaneomyia* Alexander where vein and cell *2nd A* are lost. The most similar described species are *Limonia* (*Pseudoglochina*) *fuscolata* Alexander and *L.* (*P.*) *laticincta* Alexander, with more normal venation.

Limonia (Doaneomyia) deprivata sp. n.

General coloration of notum dark brown; black pattern of legs unusually extensive, especially on the tibia where the bases are very narrowly to scarcely whitened; basitarsus extensively blackened; wings with a dusky tinge; Sc_1 ending nearly opposite origin of *Rs*; an axillary thickening to indicate the former position of vein *2nd A*.

Male.—Length, about 5 mm.; wing, 6 mm.

Rostrum light yellow; palpi very reduced. Antennae dark brown; flagellar segments oval, the more basal ones with conspicuous apical pedicels. Front and anterior vertex yellow; posterior vertex dark brown on central portion, the genae broadly yellow; anterior vertex broad, approximately four times the diameter of scape.

Pronotum dark brown, paling to obscure yellow on sides. Mesonotum almost uniformly dark brown; pleura light yellow. Halteres elongate, dark brown. Legs with the coxae and trochanters yellow; femora uniformly black; tibiae black, the extreme base obscurely whitened, about the apical fifth snowy-white; tarsi white, the extreme proximal end of basitarsus and nearly its outer half similarly white, the intermediate part brownish black. Wings with an unusually strong dusky tinge, the oval stigma dark brown; veins brownish black. Venation Sc_1 ending about opposite or very shortly before origin of *Rs*, Sc_2 a short distance from its tip, Sc_1 alone more than one-third *Rs*; anterior cord oblique; *Rs* a trifle longer than basal section of R_{4+5}; cell *2nd* M_2 nearly twice its petiole; *m-cu* close to or slightly beyond the fork of *M*; a very slight axillary thickening that presumably indicates the former position of vein *2nd A*.

Abdominal tergites dark brown; sternites weakly bicoloured, pale brown basally, the narrower apical portions obscure yellow.

Holotype, ♂, St. Louis, altitude 1200 ft., January 22, 1946 (*Herron*). Paratopotypes, 2 ♂, October 20, November 11, 1945.

The present fly is readily distinguished from all other regional members of the subgenus by the coloration of the legs and the other diagnostic features above listed.

Limonia (Doaneomyia) altitarsis caledoniensis subsp. n.

Male.—Length, about 6–6·5 mm.; wing, 6–7 mm.

Female.—Length, about 5·5 mm.; wing, 5·5 mm.

Generally similar to the typical form, *altitarsis* (Edwards), of New Hebrides, differing in the shorter *Sc*, more gently oblique anterior cord, and in the details of pattern of the tibiae.

Rostrum light yellow; palpi darker. Antennae dark brown; flagellar segments oval, with apical pedicels. Head light brownish yellow; anterior vertex broad.

Mesonotum very light brown or yellowish brown, the postnotum and pleura clearer yellow. Halteres elongate, dark brown. Legs with the coxae and trochanters yellow; femora black; tibiae with both bases and tips broadly and about equally snowy-white, the total amount of the latter about equal to the blackened central portion; tarsi snowy-white. Wings with a weak dusky tinge; stigma oval, darker brown, larger than in *altitarsis*; veins brown. Venation: *Sc* long, Sc_1 ending opposite or immediately before origin of *Rs*; in *altitarsis* ending far before origin of *Rs*, the distance being approximately equal to the latter vein; Sc_1 nearly as long as *Rs*; *Rs* and basal section of R_{4+5} in gently oblique alignment; cell *2nd* M_2 from about twice to nearly three times its petiole; *m-cu* at or close to fork of *M*; no trace of vein *2nd A*.

Abdomen with the tergites and hypopygium dark brown to brownish black; sternites weakly bicoloured, darkened basally, the apices paler.

Holotype, ♂, seven miles south-east of La Foa, January 30, 1945 (*Remington*). Allotopotype, ♀, April 1, 1945. Paratypes, ♂, near La Foa, resting on spider's webs in wooded ravine, April 16, 1945; February 2–13, April 1, 1945 (*Remington*).

It is certain that Edwards intended to designate this species "*albitarsis*" but through a typographical error it was called by its present name. As I have indicated elsewhere, the name *albitarsis* is already in use in the genus and the name as printed, *altitarsis*, should be retained to prevent a homonym.

Orimarga Osten Sacken.

Orimarga Osten Sacken, 1869, *Mon. Dipt. North America*, **4** : 120.

Orimarga (*Orimarga*) *risbeci* Alexander, 1934, *Philip. J. Sci.* **54** : 328–329, pl. 1, fig. 15 (venation).

Plum Farm, January, 1929 (*Jean Risbec*). St. Louis, November 11, 1945 (*Herron*).

Helius St. Fargeau.

Helius St. Fargeau, 1825, *Encycl. Method. Index* : 831.
Rhamphidia Meigen, 1830, *Syst. Beschr. zweifl. Ins.* **6** : 281.

Helius (*Helius*) *neocaledonicus* Alexander.

Helius (*Helius*) *neocaledonicus* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12** : 239–240, pl. 12, fig. 3 (venation).

Thi River Valley, November 8, 1940 (*Williams*).

Helius (Helius) stolidus sp. n.

General coloration of thorax yellow, the praescutum with four delicate brown lines; rostrum yellow, a little longer than the remainder of head; wings greyish yellow; anterior branch of *Rs* relatively short, oblique; cell 1*st* M_2 large, the basal section of vein M_{1+2} long, arcuated, about three times *r-m*; abdominal segments bicolored; male hypopygium with the lateral tergal plates very large and flattened.

Male.—Length, about 4 mm.; wing, 4·6 mm.

Rostrum testaceous yellow, a very little longer than the remainder of head; palpi pale. Antennae broken. Head obscure yellow; anterior vertex a trifle wider than the breadth of the rostrum.

Thoracic dorsum light yellow, the four usual praescutal stripes delimited by very delicate brown lines; posterior sclerites of the notum and the pleura even paler, yellowish white. Halteres broken. Legs with the coxae and trochanters whitened, the latter with a very conspicuous black spot on inner face at apex; remainder of legs broken. Wings (fig. 22) greyish yellow, the prearcular and costal fields somewhat clearer yellow; veins pale. Costal fringe of mixed setae, chiefly short but with scattered elongate bristles at and before the level of origin of *Rs*. Venation: Sc_1 ending about opposite two-fifths to midlength of *Rs*, Sc_2 near its tip; *Rs* straight, about twice the basal section of R_{4+5}; anterior branch of *Rs* relatively short, oblique, cell R_2 at margin about one-fifth that of cell R_3; basal section of R_{4+5} exceeding *r-m*; cell 1*st* M_2 large, the basal section of vein M_{1+2} long, arcuated, about three times *r-m*; *m-cu* a short distance beyond the fork of *M*.

Abdominal segments bicolored, the incisures dark, each segment with a pale transverse band; hypopygium yellow. Male hypopygium (fig. 23) with the lateral tergal arm, 9*t*, exceedingly large and flattened, extending laterad into a strong spinous point. Outer dististyle, *d*, with the axial spine strongly curved, the lateral one much smaller. Inner dististyle with the apical point including nearly half the total length; lower margin of the expanded portion with two pairs of setae.

Holotype, ♂, Mont Mou, altitude 4000 ft., December 16, 1945 (*Herron*).

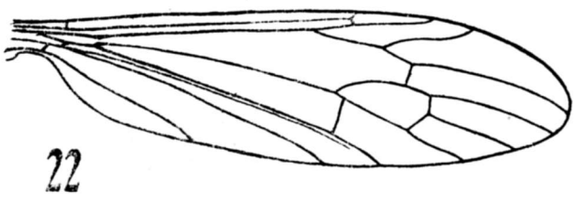
Helius (*Helius*) *stolidus* is entirely different from all other regional members of the genus, differing from all in the venation, particularly the large cell 1*st* M_2. The homologies of the structure above described as a tergal arm are still puzzling. In different species these have been interpreted as being gonapophyses or as lateral arms of a tergal plate. In the present fly the plate is exceptionally distinct and the interpretation given seems to be correct.

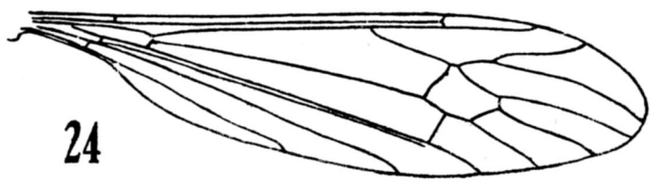
Subgenus **Idiohelius** subgen. n.

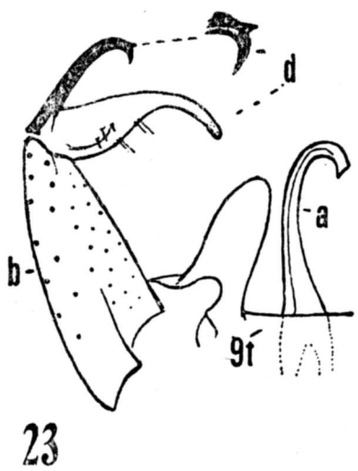
Characters as in *Eurhamphidia* Alexander, differing especially in the peculiar venation (fig. 25). Five branches issue from the unusually large cell 1*st* M_2, these being R_{2+3}, R_{4+5}, M_{1+2}, M_3 and M_4; this is possible because of long fusions of veins *Rs* and M_{1+2} and R_{4+5} and M_{1+2}, a unique feature in the entire family.

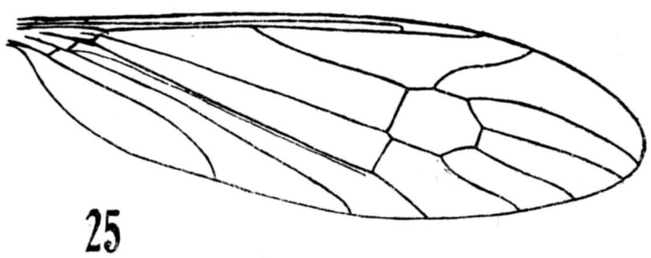
Type of the subgenus.—*Helius* (*Idiohelius*) *pentaneura* sp. n.

The present fly requires no possible comparison with the other subgeneric groups of *Helius*. Despite the fact that the venation is unique, nevertheless it seems obviously to have been derived from *Eurhamphidia* which must be considered the nearest ally.









FIGS. 22–25 (LIMONIINI; genus *Helius*).—22, *Helius* (*Helius*) *stolidus* sp. n.; venation. 23, *Helius* (*Helius*) *stolidus* sp. n.; male hypopygium. 24, *Helius* (*Eurhamphidia*) *mouensis* sp. n.; venation. 25, *Helius* (*Idiohelius*) *pentaneura* sp. n.; venation.
(Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *t*, tergite.)

Helius (**Idiohelius**) **pentaneura** sp. n.

General coloration almost white, the mesonotum and the abdominal tergites conspicuously patterned with brown; wings pale yellow, restrictedly patterned with pale brown; cell 1*st* M_2 large, with five veins issuing from it, as defined under the subgenus.

Female.—Length, about 5·5 mm.; wing, 5–5·2 mm.

Rostrum yellow, relatively slender, about as long as the remainder of head; palpi yellow. Antennae with scape and pedicel obscure yellow; remainder of organ broken. Head in front and on orbits silvery white, the centre of the posterior vertex more yellowed.

Pronotum yellowish white. Mesonotum white, conspicuously patterned with brown on the praescutum including a very pale brownish yellow central stripe that deepens and broadens behind, near the suture more distinct and more or less split, nearly confluent with the short lateral stripes, the whitened praescutal borders thus very broad; scutal lobes extensively brown; a small brown spot on either side of the scutellum, the remainder, including the parascutella, pale; mediotergite dark brown, restrictedly pale at cephalic portion. Pleura and pleurotergite uniformly whitened. Halteres elongate, stem whitened, knob brown. Legs with the coxae and trochanters whitened; femora yellow, the tips narrowly infuscated; tibiae and tarsi yellow. Wings (fig. 25) broad, with a very pale yellow ground, restrictedly patterned with pale brown, as follows: A very small cloud at

arculus; a broken band at level of origin of *Rs*, including a large spot at *Rs* and another in the margin of cell 1*st A* about midway between the veins; cord and outer end of cell 1*st* M_2 narrowly seamed with brown; vague dark clouds in outer ends of cells R_4 and 2*nd* M_2; a small isolated cloud in cell 2*nd A* at near one-third the length; stigma oval, somewhat darker brown; veins yellow brown in the patterned areas. Venation: *Sc* long, Sc_1 ending almost opposite the fork of *Rs*; remainder of venation as discussed under the subgeneric definition; *m-cu* only a short distance beyond the fork of *M*. The fragmentary paratype has the costal fringe longer and more conspicuous than in the type and is presumed to be a male.

Abdomen yellow, the tergites with narrow subbasal brown rings; ovipositor with the valves very long and slender, especially the hypovalvae.

Holotype, ♀, St. Louis, altitude 1200 ft., October 20, 1945 (*Herron*). Paratopotype, a fragment, altitude 1100 ft., December 30, 1945 (*Herron*); of this specimen scarcely more than the legs and wings remain.

The present very interesting fly requires no comparison with any other described crane-fly.

Helius (Eurhamphidia) mouensis sp. n.

General coloration of thorax bright yellow, restrictedly patterned with brown; head brownish yellow, sparsely pruinose, the posterior vertex with a brown area; legs brownish black, the outer fifth of tibiae and the tarsi snowy-white; genua vaguely to scarcely brightened; wings subhyaline, the apex narrowly infuscated; stigma oval, darker brown; *Rs* fused with M_{1+2} for a short distance, obliterating *r-m*; male hypopygium with the apex of the outer dististyle a strongly curved spine, the subapical point appressed.

Male.—Length, about 5 mm.; wing, 5·5 mm.

Rostrum obscure yellow, darker above, the apex, including palpi, broken but the entire structure is presumably shorter than the remainder of head. Antennae broken. Head obscure brownish yellow, sparsely pruinose, the posterior vertex with a large brown area; anterior vertex moderately wide, approximately twice the diameter of rostrum at base.

Pronotum pale brown above, more yellowed laterally. Mesonotal praescutum chiefly bright yellow, including the praescutal stripes and the scutal lobes, the areas separated by very delicate brown lines; scutellum light brown; postnotum yellow, the mediotergite with a brown central line on the protuberant posterior half, the cephalic half more uniformly pale brown. Pleura yellow, the ventral sternopleurite weakly darkened; posterior pleurites slightly more pruinose. Halteres with stem obscure brownish yellow, knob broken. Legs with the coxae yellow, the fore pair very weakly more infuscated; femora brownish black the genua vaguely and very narrowly more brightened; tibiae brownish black, with about the outer fifth snowy-white; tarsi white. Wings (fig. 24) subhyaline, the tip narrowly infuscated, most distinctly in the outer end of cell R_3; a vague dark seam along basal portion of vein *Cu*; cells *C* and *Sc* very weakly darkened; stigma oval, conspicuous, darker brown; veins brown. Venation: Sc_1 ending about opposite end of first section of *Rs*, Sc_2 at its tip; a short fusion of *Rs* and M_{1+2}, beyond which *Rs* continues to its fork, the second section of *Rs* about one-half the first; *r-m* obliterated by the above mentioned fusion; *m-cu* at near midlength of lower face of cell 1*st* M_2; cell 2*nd A* relatively narrow.

Abdominal tergites chiefly dark brown, the posterior borders narrowly pale; sternites testaceous, the bases of the intermediate segments darkened; subterminal segments more intensely infuscated; styli yellow. Male hypopygium with the tergite blackened, the caudal margin with a broad V-shaped emargination. Outer dististyle with apex strongly curved, with one or two microscopic denticles in the concave portion and with a strong appressed spine on outer margin before the curvature begins. Inner dististyle about one-third longer, pale, the outer half strongly narrowed, terminating in two strong pale setae. Spine of lateral end of tergite slender.

Holotype, ♂, Mont Mou, altitude 4000 ft., December 16, 1945 (*Herron*).

Helius (*Eurhamphidia*) *mouensis* is quite distinct from the other species of the subgenus. In some regards it is closest to *H.* (*E.*) *niveitarsis* (Skuse), of Eastern Australia, differing in the pattern of the legs and wings and in the venation. The obliteration of *r–m* by the short fusion of *Rs* and M_{1+2} in the present fly provides a unique character.

Hexatomini.

Epiphragma Osten Sacken.

Limnophila (*Epiphragma*) Osten Sacken, 1859, *Proc. Acad. nat. Sci. Philadelphia* **1859**: 238.

Epiphragma (Epiphragma) petulantia sp. n.

General coloration of mesonotum yellow, grey pruinose, the cephalic third of the praescutum paler and more glabrous; pleura yellow; antennae short, fusion-segment yellow, remainder of flagellum black; legs yellow, the femora with a very faintly indicated brown subterminal ring; wings yellow, spotted and dotted with dark and paler brown; costal fringe (male) long and conspicuous; male hypopygium with the interbase a straight rod, its tip a slender recurved spine, the inner margin before apex with a paler erect spinous point.

Male.—Length, about 7·5–9 mm.; wing, 7–8·8 mm.

Rostrum light brown; palpi dark brown. Antennae short; scape brown, its tip yellow; pedicel pale brown; fusion-segment yellow, remainder of flagellum black; fusion-segment short, subequal in length to the pedicel. Head above brown, grey pruinose, the anterior vertex light brown.

Pronotum above yellow. Mesonotal praescutum with the cephalic third, including the broad anterior and lateral margins more glabrous than the slightly pruinose posterior portion; humeral and lateral regions weakly infuscated; posterior sclerites of notum, including the praescutum as described, yellow, sparsely pruinose, delicately lined with brown, including a more or less distinct capillary median vitta over almost the whole length of the mesonotum, broader on the scutum, subobsolete on the mediotergite, in some specimens much less distinct than in others. Pleura and pleurotergite yellow. Halteres weakly infuscated. Legs with the coxae yellow, sparsely pruinose; trochanters yellow; femora yellow with a very faint indication of a subterminal brown ring; remainder of legs yellow, the terminal tarsal segments infuscated. Wings (fig. 26) yellow, the costal border a little more saturated; a restricted brown spotted and dotted pattern, the somewhat larger areas at origin of *Rs*, tip of *Sc*, cord and as marginal spots at ends of veins, largest on the anal veins, all areas solid, not ocelliform; a further paler brown dotting in the various cells, the marks small and scattered; veins yellow, brown in the patterned portions. Costal fringe (male) long and conspicuous. Venation: Supernumerary cross vein in cell *C* lacking or barely indicated; R_2 near tip of R_{1+2}; petiole of cell M_1 short, subequal to *m*; *m-cu* at near one-third to one-fourth the length of cell 1*st* M_2.

Abdomen orange yellow, including the hypopygium, the basal tergite slightly more infuscated. Male hypopygium (fig. 27) with the tergal lobes, 9*t*, triangular, separated by notch that has nearly the same outline. Interbase, *i*, a slender straight rod, the tip a recurved slender spine, its inner margin before apex with a paler erect spinous point. Outer dististyle, *od*, relatively broad, the tip a decurved point; outer margin before apex with a low flange. Inner dististyle longer, very gently curved, the tip obtuse.

Holotype, ♂, St Louis, altitude 1100, ft., December 30, 1945 (*Herron*). Paratopotypes, 2 ♂, altitude 1100–1200 ft., November 11, 1945, January 22, 1946 (*Herron*).

Readily distinguished from the only other generally similar regional species, *Epiphragma* (*Epiphragma*) *legatoria* sp. n., by the coloration of the body and legs. The two flies are closely related as shown by the structure of the male hypopygium, especially the interbase. It should be noted further that certain Australian species, such as *E.* (*E.*) *antiqua* (Skuse), hitherto placed in the genus *Austrolimnophila* Alexander because of the lack of a supernumerary crossvein in cell *C* of the wings, seem more correctly placed in *Epiphragma* despite this character. The basic structure of the male hypopygium in all of these flies is quite as in *Epiphragma* and different from the condition in *Austrolimnophila*, where the hypopygial details are much more varied in the different species than is the case in *Epiphragma*.

Epiphragma (Epiphragma) legatoria sp. n.

Generally similar to *petulantia*, differing in coloration; femora yellow with a broad black subterminal ring that is more than twice as wide as the obscure yellow tip; wings abundantly dotted and spotted with brown.

Male.—Length, about 8–8·5 mm.; wing, 9·5 mm.; antenna, about 1·4–1·5 mm.

Female.—Length, about 9·5–10 mm.; wing, 9·5 mm.

Rostrum and palpi black. Antennae black; pedicel yellow basally, darker at tip; first flagellar segment small, yellow; flagellar segments long-cylindrical, with verticils that are about equal in length to the segments. Head brown, sparsely yellow polinose, especially near the eyes.

Pronotum yellow above, brown on sides. Praescutum with the cephalic third and lateral borders dark brown, confluent with the uniformly darkened pleura; disk of praescutum brownish grey, sublaterally behind more yellowed; cephalic portion of praescutum with a further capillary darkened line; scutal lobes each with two chestnut areas, isolated by more greyish brown; scutellum brownish grey, narrowly obscure yellow behind; mediotergite brownish grey, the posterior fourth obscure yellow, divided medially by a capillary dark vitta; lateral portion of mediotergite, and ventral edge of pleurotergite restrictedly orange. Halteres obscure yellow. Legs with the fore coxae dark brown, the tips narrowly pale, remaining coxae very pale yellow, the bases very narrowly brownish black; trochanters pale yellow; femora yellow, with a broad black subterminal ring, this more than twice as broad as the obscure brownish yellow tip; tibiae yellow, the tips broadly but weakly infuscated; tarsi yellow. Wings pale yellow, with a sparse pattern of dark brown spots and an abundantly dotted pattern of paler brown; darker spots at ends of all longitudinal veins, the largest at *Sc*; other brown spots at origin of *Rs*, along cord and outer end of cell 1*st* M_2, and over the forks of R_{2+3+4} and M_{1+2}, the pale brown dots in all the cells. Costal fringe (male) long and conspicuous, fully as long as the width of cell *C*; *Rs* long, nearly square at origin; R_{2+3+4} about twice the basal section of R_5; R_2 lying very far distad, much longer than R_{1+2}; elements of anterior cord in transverse alignment; cell 1*st* M_2 widened outwardly; cell M_1 very deep, its petiole about one-half *m*; *m-cu* at near one-third the length of cell 1*st* M_2.

Abdominal tergites reddish brown; sternites obscure yellow, more infuscated on the sides; hypopygium obscure yellow. Structure of male hypopygium much as in *petulantia*.

Holotype, ♂, St. Louis, altitude 1200 ft., January 22, 1946 (*Herron*). Allotopotype, ♀. Paratopotypes, 3 ♂; paratype, 1 ♀, Mont Mou, altitude 900 ft., February, 1947 (*Garrigou*).

Although the present species differs rather conspicuously from *petulantia* in the size and general coloration, particularly of the legs, there can be no question of the close relationship.

Gynoplistia Westwood.

Gynoplistia Westwood, 1835, *London and Edinburgh phil. Mag. and J. Sci.* **6** : 280.

Gynoplistia (*Paralimnophila*) *neocaledonica* Alexander.

Gynoplistia (*Paralimnophila*) *neocaledonica* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12** : 240–242, pl. 12, fig. 4 (venation), fig. 8 (male hypopygium).

Nepoui Valley, August, 1940 (*Williams*).

Gynoplistia (Paralimnophila) remingtoni sp. n.

General coloration brown and yellow; thoracic dorsum chiefly brown, light grey pruinose; pleura and pleurotergite somewhat paler brown, the two areas separated by a broad pale yellow dorsopleural area; antennae 14-segmented, flagellar segments simple, bicoloured; legs yellow; wings whitened, restrictedly spotted and washed with brown, most of the cells with further abundant brown dots; cell 1*st* M_2 small, rectangular, subequal in length to *m-cu*, the latter placed at from one-third to one-fourth the length of the cell.

Female.—Length, about 13 mm.; wing, 9·5 mm.

Described from a specimen in spirit.

Rostrum yellow; basal segment of palpus chiefly yellow, darker at proximal end; outer segments broken. Antennae 14-segmented, bicoloured, yellow, the basal third or slightly more of the flagellar segments infuscated; flagellar segments simple, subcylindrical, the

longest verticils slightly exceeding the segments in length. Head obscure yellow or brownish yellow.

Pronotum above light yellow, abruptly more darkened on sides. Mesonotum with central portion occupied by a brown median stripe, paler brown and narrowed to a point on cephalic portion of praescutum, gradually widened behind, on posterior portion occupying most of the sclerites; lateral praescutal borders and adjacent portions of the dorsopleural region abruptly yellowish white. Remainder of pleura and the pleurotergite paler brown than the dorsum, contrasting abruptly with the yellow dorsopleural stripe. Halteres with base of stem weakly infuscated, remainder pale, the extreme base of knob weakly infuscated. Legs with the coxae and trochanters pale yellow; remainder of legs yellow, the outer tarsal segments scarcely darkened. Wings with the ground colour conspicuously whitened, restrictedly spotted and washed with darker and with abundant pale brown dots in most cells; the larger brown area includes the stigma and a confluent cloud over the fork of *Rs*; less evident washes over the entire length of vein *Cu* and in the outer portion of cell R_5; the brown dots are more numerous in the central third of wing, larger and darker in cell *M* adjoining vein *Cu*; cephalic and posterior thirds of wing more nearly free from markings; cells *Sc* and Cu_1, yellow, virtually free from pattern; veins yellow, restrictedly darkened in the patterned fields. Venation: Sc_1 ending about opposite fork of R_{2+3+4}, Sc_2 nearly opposite or just before the fork of *Rs*; R_{2+3+4} about one-half the basal section of R_5; petiole of cell M_1 from about one-half to nearly two-thirds the cell; cell 1*st* M_2 small, rectangular, subequal in length to *m-cu*, the latter placed from one-third to one-fourth the length of the cell.

Abdomen brownish yellow, the tergites more infuscated medially on basal half of each segment, the posterior ring clearer yellow; sternites and pleural membrane yellow. Ovipositor with the hypovalvae and bases of cerci weakly infuscated, the remainder of the latter yellow horn colour; cerci long and slender, gently upcurved.

Holotype, ♀ in spirit, seven miles south-east of La Foa, swept from undergrowth in a moist forested ravine at the base of steep hills, April 22, 1945 (*Remington*); No. 1. Paratype, ♀, Mont Mou, altitude 900 ft., February, 1947 (*Garrigou*).

I take great pleasure in naming this very distinct fly after the collector, Mr. Charles L. Remington, to whom I am greatly indebted for many TIPULIDAE from the United States and New Caledonia. Although only the female sex is available at the time of description there is no doubt of the subgeneric reference. The species is entirely distinct from *Gynoplistia* (*Paralimnophila*) *neocaledonica* Alexander, being more like certain Australian species, such as *G.* (*P.*) *guttulicosta* Alexander.

Gynoplistia (*Gynoplistia*) *williamsiana* Alexander.

Gynoplistia (*Gynoplistia*) *williamsiana* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12**: 242–243, pl. 12, fig. 5 (venation), fig. 9 (male hypopygium).

St. Louis, October 14, 1940 (*Williams*); Thi River Valley, November 6, 1940 (*Williams*). Mont Chapeau Gendarme, near St. Louis, in rain forest, June 7, 1944, September 13, 1944, November 8, 1944 (*Herron*).

Gynoplistia (**Gynoplistia**) **nigriventris** sp. n.

Thorax uniformly orange; head black; antennae brown, in female with ten branched segments; abdomen, except for the first and the last segments, uniformly blackened.

Female.—Length, about 13 mm.; wing, 9·7 mm.

Rostrum and palpi brownish black. Antennae (female) 16-segmented, the formula 2 10 4; scape brownish black, pedicel dark brown, flagellum, including branches, brown; last branch a trifle shorter than the segment; longest branch (about flagellar segment six or seven) approximately three times the segment. Head black; anterior vertex broad.

Thorax uniformly orange. Halteres with stem yellow, knob dark brown. Legs with the coxae orange; trochanters yellow; femora black, the bases obscure yellow, on the posterior legs including about the proximal third or fourth; tibiae black, tarsi paling to brown. Wings with the ground rather strongly infuscated, especially along the veins, the centres of the cells somewhat paler, especially evident as streaks in cells *R*, *M*, 1*st* M_2 and 1*st A*; broad brown

seams at origin of *Rs* and over the anterior cord; costal border weakly darkened; veins brown. Veins beyond cord glabrous, excepting R_5 which bears a series of trichia over virtually the whole length. Venation: R_{2+3+4} and basal section of R_5 subequal; cell R_3 at margin relatively wide, approximately three times cell R_2; cell M_1 about one-half longer than its petiole; cell 1*st* M_2 rectangular, with *m-cu* at near midlength.

Abdomen with the basal segment yellow, the remainder of abdomen brownish black to black, the tergites somewhat darker; genital shield and ovipositor orange.

Holotype, ♀, St. Louis, altitude 1200 ft., January 22, 1946 (*Herron*).

Similar to *Gynoplistia* (*Gynoplistia*) *williamsiana* Alexander which has the flagellar branches of the female shorter and only nine in number and with the abdomen, excepting segments six and seven, entirely orange.

Eriopterini.

Gonomyia Meigen.

Gonomyia Meigen, 1818, *Syst. Beschr. zweifl. Ins.* **1**: 146.

Gonomyia (*Idiocera*) *cockerelli* Alexander.

Gonomyia (*Ptilostena*) *cockerelli* Alexander, 1929, *Encycl. Ent., Diptera*, **5**: 91–92, fig. 5 (venation).

Dge, Ile Ouen, June 6, 1928 (*Cockerell*).

Gonomyia (*Lipophleps*) *novocaledoniae* Alexander.

Gonomyia (*Lipophleps*) *novocaledoniae* Alexander, 1945, *Proc. Hawaii. ent. Soc.* **12**: 243–244, pl. 12, fig. 6 (venation), fig. 10 (male hypopygium).

St. Louis, 1940 (*Williams*).

Gonomyia (Lipophleps) capnitis sp. n.

Size small (wing, male, 3·5 mm.); rostrum black; antennae with basal segments chiefly yellow; mesonotum brownish grey, including the scutellum; pleura dark brown with a conspicuous yellow longitudinal stripe; femora obscure yellow, the tips darker; wings with a strong brownish tinge, the costal border broadly yellow; costal fringe (male) long and conspicuous; cell 1*st* M_2 about equal in length to the distal section of vein M_3; male hypopygium with the outer dististyle a long slender rod; phallosome consisting essentially of two pairs of blackened apophyses, the longest at tip dilated into a weak head.

Male.—Length, about 4 mm.; wing, 3·5 mm.

Rostrum and palpi black. Antennae with scape yellow above, more infuscated beneath; pedicel yellow; basal three or four flagellar segments light brown, the outer ones brownish black; elongate-cyclindrical, with the exceedingly elongate verticils common in males of this subgenus. Head yellow, the centre of vertex more or less darkened.

Pronotum yellow, darkened medially above; pretergites and posterior lateral borders of praescutum similarly yellow. Mesonotum chiefly brownish grey, the mesal and posterior edges of the scutal lobes obscure yellow, the centre of the scutum extensively darkened; scutellum uniformly darkened; lateral borders of mediotergite yellow, pleurotergite chiefly yellow, the ventral portion darkened. Pleura dark brown, with a broad and conspicuous yellow longitudinal stripe extending from and including the fore coxae, passing over the dorsal sternopleurite and pteropleurite onto the meral region; dorsopleural region darkened. Halteres yellow, knob weakly darkened. Legs with the coxae yellow, the fore pair more intensely so; trochanters yellow; femora obscure yellow, the tips darker; tibiae and tarsi dark brown to black. Wings with a strong brownish or smoky tinge, the costal border broadly and conspicuously yellow, including the costal field and invading cells R and R_1, including virtually all of the latter cell; veins brown, much paler in the brightened portions. Costal fringe (male) long but sparse. Venation: *Sc* relatively long, Sc_1 ending a short distance before origin of *Rs*, Sc_2 at or beyond its tip; cell 1*st* M_2 long, about equal to vein M_3 beyond it; *m-cu* shortly before the fork of *M*.

Abdominal tergites light brown, sternites somewhat paler; hypopygium obscure yellow.

Male hypopygium with the dististyles terminal in position, with no apical projection of the basistyle. Outer dististyle a long rod, its apical third curved, narrowed into an acute black spine. Inner dististyle small and fleshy, the two fasciculate setae at the upper outer angle. Phallosome including two pairs of blackened gonapophyses, the longest pair straight, before tips slightly expanded into a head that is further produced into an acute spine, before the spine on outer margin with microscopic denticles; shorter apophyses appearing as slender black spines, their tips acutely pointed.

Holotype, ♂, near La Foa, February 11, 1945 (*Remington*). Paratopotypes, 2 ♂, February 11–13, 1945.

The present fly is most similar to *Gonomyia* (*Lipophleps*) *fijiensis* Alexander, which has the wing coloration somewhat the same, differing conspicuously in the details of venation and, especially, the structure of the male hypopygium. The species is much less like *G.* (*L.*) *novocaledoniae* Alexander.

Gonomyia (**Gonomyia**) **herroni** sp. n.

General coloration of mesonotum dark brown, the pleura and pleurotergite variegated with dirty white; rostrum yellow; halteres elongate, dark brown; wings with a faint greyish tinge, the stigmal region a trifle more infuscated: Sc_1 ending just before origin of *Rs*, Sc_2 at its extreme tip; *Rs* nearly one-half longer than R_{2+3+4}; vein R_3 elongate; cell 1*st* M_2 closed, a little shorter than vein M_4; valves of ovipositor very long and slender, especially the cerci.

Female.—Length, about 3·6 mm.; wing, 4 mm.

Rostrum yellow, palpi dark brown. Antennae with scape and pedicel brownish black, flagellum broken. Head grey.

Pronotum above and the pretergites china-white, darker laterally. Mesonotum almost uniformly dark brown; tuberculate pits black; near the extreme cephalic portion of praescutum; pseudosutural foveae more reddish brown; pleurotergite chiefly dirty white. Pleura pale brown, variegated by dirty white on the dorsal sternopleurite and more extensively so on the posterior pleurites; dorsopleural region pale. Halteres elongate, dark brown; base of stem narrowly pale. Legs with the fore and middle coxae pale brown, the smaller middle pair paler; trochanters obscure yellow; remainder of legs broken. Wings (fig. 28) with a faint greyish tinge, the stigmal region a trifle more infuscated, vein R_{1+2} in this area pale and indistinct; remaining veins brown. Venation: Sc_1 ending just before origin of *Rs*, Sc_2 at its extreme tip; *Rs* nearly one-half longer than R_{2+3+4}; vein R_3 elongate, about one-fourth longer than R_{2+3+4} and in virtual alignment with it; cell 1*st* M_2 closed, long-subrectangular, gently widened outwardly, a little shorter than vein M_4; *m-cu* about one-half its length beyond the fork of *M*; cell 2*nd* *A* relatively narrow; anterior arculus broken.

Abdomen dark brown. Ovipositor with basal shield and the valves very long, especially the slender gently upcurved cerci.

Holotype, ♀, St. Louis, altitude 1200 ft., November 11, 1945 (*Herron*).

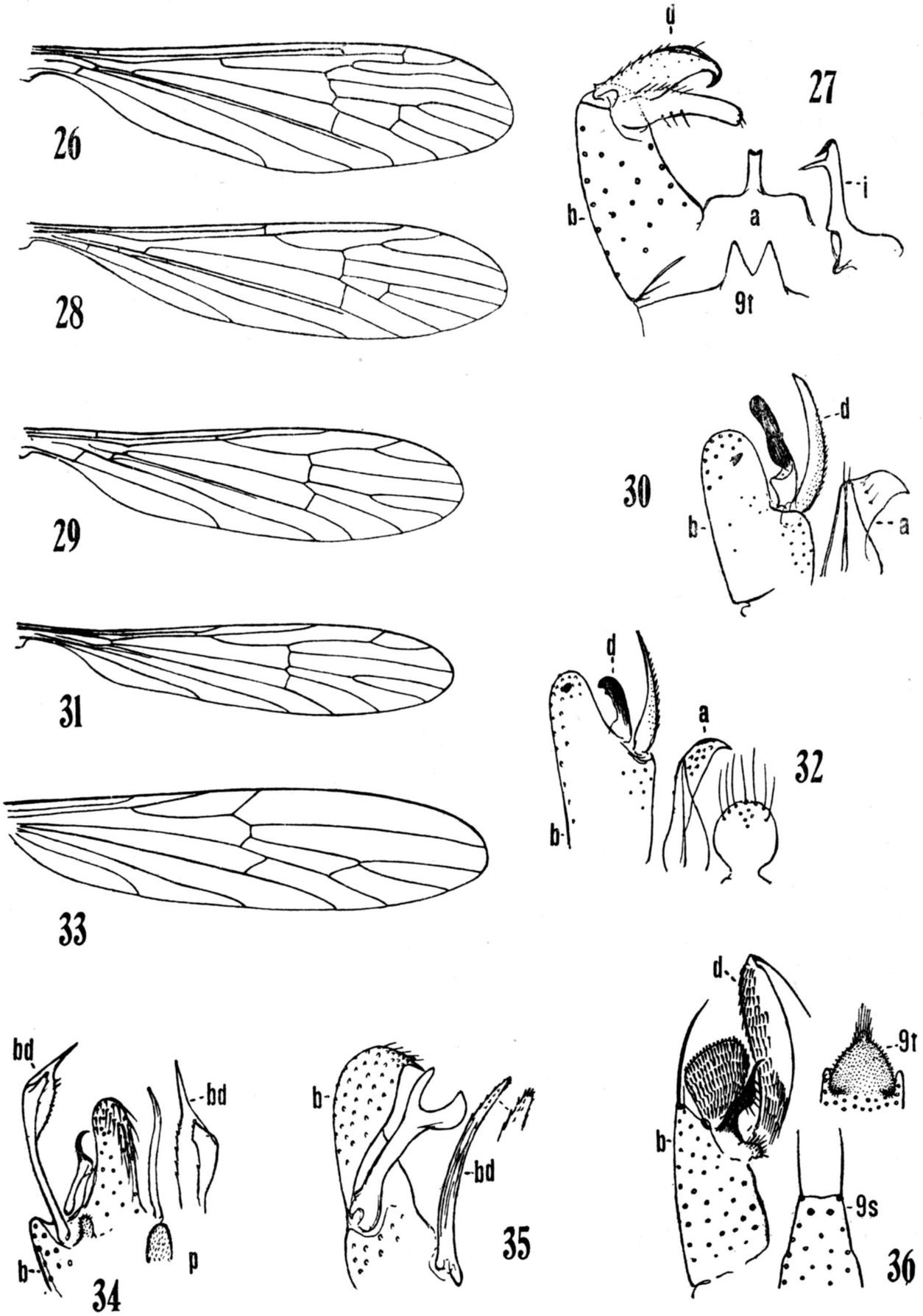
This unusually distinct fly is named after the collector, Mr. John C. Herron, to whom our greatest increase in knowledge of the TIPULIDAE of New Caledonia is due. The species is entirely distinct from all other regional members of the subgenus, especially in the unusually elongate vein R_3 and the corresponding deep cell.

Gymnastes Brunetti.

Gymnastes Brunetti, 1911, *Rec. Indian Mus.* **6**: 281.

Gymnastes (**Paragymnastes**) **dasycera** sp. n.

General coloration of thorax yellow, the mesonotum patterned with black, the central praescutal stripes, in cases, paling to reddish; antennae (male) elongate, exceeding the body in length, the segments with abundant erect black setae; tarsi black; wings subhyaline, extensively but weakly patterned with pale brown in male, more restrictedly crossbanded with darker brown in female; cell M_2 open by atrophy of basal section of M_3; male hypopygium with the inner dististyle yellow, slender, narrowed into a long apical spine.



FIGS. 26–36 (HEXATOMINI, ERIOPTERINI).—26, *Epiphragma* (*Epiphragma*) *petulantia* sp. n.; venation. 27, *Epiphragma* (*Epiphragma*) *petulantia* sp. n.; male hypopygium. 28, *Gonomyia* (*Gonomyia*) *herroni* sp. n.; venation. 29, *Gymnastes* (*Paragymnastes*) *dasycera* sp. n.; venation. 30, *Gymnastes* (*Paragymnastes*) *niveipes* sp. n.; male hypopygium. 31, *Gymnastes* (*Paragymnastes*) *niveipes* sp. n.; venation. 32, *Gymnastes* (*Paragymnastes*) *dasycera* sp. n.; male hypopygium. 33, *Styringomyia neocaledoniae* sp. n.; venation. 34, *Molophilus* (*Molophilus*) *tartarus* sp. n.; male hypopygium. 35, *Molophilus* (*Molo-*; *philus*) *ordinarius* sp. n.; male hypopygium. 36, *Styringomyia neocaledoniae* sp. n.; male hypopygium.

(Symbols: *a*, aedeagus; *b*, basistyle; *bd*, basal dististyle; *d*, dististyle; *i*, interbase; *p*, phallosome; *s*, sternite; *t*, tergite.)

Male.—Length, about 4–4·5 mm.; wing, 4·8–5·2 mm.; antenna, about 4·5–5 mm.

Female.—Length, about 4·5 mm.; wing, 5 mm.

Male.—Rostrum yellow; palpi dark brown. Antennae elongate, exceeding the body in length; scape yellow, pedicel brown, flagellum black; flagellar segments elongate-cylindrical, with abundant dense erect black setae over the entire length. Head above yellow, the anterior vertex infuscated.

Pronotum yellow. Mesonotum yellow, the praescutum with four nearly confluent black stripes, in cases the central ones more reddened, especially in front, the intermediate pair more divided behind; lateral stripes crossing the suture onto the scutal lobes; mediotergite yellow, the posterior half with two paired oval greyish brown areas; remainder of notum and the pleura yellow. Halteres with stem obscure whitish, knob dark brown. Legs with the coxae and trochanters yellow; femora and tibiae obscure yellow, the tips brownish black, the remaining surface chiefly blackened by abundant darkened scales; tarsi black. Wings (fig. 29) subhyaline, very weakly patterned with pale brown, the latter including most of the cells beyond the cord, paler in the region of the stigma; basad of cord a further major weakly infuscated area, chiefly at level of base of *Rs*, in cell *Cu* more extended toward the wing base, the latter more yellowed; veins brown, those at wing base paler. Costal fringe relatively long and dense. Venation: Sc_1 ending about opposite one-third to one-fourth *Rs*, Sc_2 almost opposite this origin; R_2 lacking; R_{2+3+4} from one-third to one-half longer than the oblique R_3; cell M_2 open by the atrophy of the basal section of M_3; *m-cu* nearly its own length beyond the fork of *M*.

Abdomen with tergites, including hypopygium, dark brown; sternites more yellowed. Male hypopygium (fig. 32) with the basistyle, *b*, produced beyond the level of the bases of the dististyles as a stout obtuse lobe, the apex and outer face of which bears strong setae; near apex with a blackened lobe or obtuse spine. Two dististyles, *d*, the outer one short and blackened, its head portion elongate, weakly bidentate at tip; inner dististyle long and slender, yellow, narrowed into a long apical spine, the inner face with abundant delicate setae. Aedeagus, *a*, having its surface with several small tubercles, each bearing a seta.

Female.—Antennae broken, but presumably short, as usual in the genus. Praescutum with the central stripes virtually obliterated, concolorous with the ground; lateral stripes, especially their posterior ends, evident. Wing pattern much heavier but more restricted, appearing as three more narrowed bands, placed at origin of *Rs*, along cord and at the wing tip.

Holotype, ♂, Paita, September 16, 1945 (*Herron*). Allotopotype, ♀, pinned with type. Paratopotypes, 2 ♂; paratypes, 2 ♂, St. Louis, altitude 1200 ft., October 20, 1945 (*Herron*).

The present fly, together with the species next described, is unique in the genus in the unusually lengthened antennae of the male sex. Superficially this species suggests *Gymnastes* (*Paragymnastes*) *cyanoceps* (Alexander), of Northern Australia.

Gymnastes (Paragymnastes) niveipes sp. n.

Size small (wing, male, 4 mm.); antennae (male) elongate; general coloration of mesonotum medium brown, the pleura and most of pleurotergite yellow; tarsi snowy white; wings subhyaline, unpatterned; vein R_{2+3+4} longer than *Rs*; cell M_2 open by the atrophy of vein M_3; male hypopygium with the blackened head of the outer dististyle elongate.

Male.—Length, about 3·5 mm.; wing, 4 mm.; antenna, about 2·8 mm.

Rostrum yellow; palpi brownish black. Antennae much as in *dasycera* though somewhat shorter but with the same erect black setae; scape yellow, pedicel brown, flagellum black. Head obscure yellow, the centre of vertex infuscated.

Pronotum and pretergites yellow. Mesonotal praescutum chiefly medium brown, the posterior interspaces vaguely more yellowed; scutal lobes similarly brown; median region of scutum yellow with a conspicuous dark brown central spot at suture; scutellum more testaceous yellow; mediotergite yellow, slightly more darkened on posterior portion. Pleura and most of pleurotergite yellow. Halteres infuscated. Legs with the coxae yellow, the fore pair somewhat more infuscated; trochanters yellow; femora and tibiae obscure yellow, much darkened by a covering of brown scales; tarsi snowy-white, somewhat clearer on posterior legs. Wings (fig. 31) subhyaline, without pattern; veins brown. Venation: *Sc* short, Sc_1 ending a very short distance beyond the origin of *Rs*, Sc_2 before this origin; R_{2+3+4} longer than *Rs* and nearly straight; vein R_3 oblique, cell R_3 relatively small; cell M_2 open by the atrophy of the basal section of vein M_3; cell 2*nd* M_2 a trifle longer than its petiole; *m-cu* about two-thirds its length beyond the fork of *M*.

Abdominal tergites dark brown, the hypopygium scarcely brighter; sternites yellow. Male hypopygium (fig. 30) of the same general type as *dasycera*, differing in all details. Basistyle, *b*, with the spine more slender and well-defined. Outer dististyle, *d*, with the blackened head even more elongate and produced; a single small seta on outer margin before midlength of head; inner dististyle a more flattened blade, the tip only moderately narrowed. Apex of aedaegus, *a*, stout, the setae relatively few.

Holotype, ♂, St. Louis, altitude 1200 ft., October 20, 1945 (*Herron*).

The only other similar species is *Gymnastes* (*Paragymnastes*) *dasycera* sp. n., which differs in the larger size, patterned wings and blackened tarsi.

Erioptera Meigen.

Erioptera Meigen, 1803, *Illiger's Mag.* **2** : 262.

Erioptera (*Trimicra*) *pilipes* (Fabricius), var.

Tiupla pilipes Fabricius, 1787, *Mantissa Ins.* **2** : 324.

Noumea, July–August, 1940; St. Louis, October 14, 1940 (*Williams*).

Molophilus Curtis.

Molophilus Curtis, 1833, *British Ent.* : 444.

Molophilus (**Molophilus**) **tartarus** sp. n.

Belongs to the *gracilis* group; size small (wing, male, 3·5 mm.); general coloration brown; wings with a weak brownish tinge; R_2 lying some distance before the level of *r-m*, R_{2+3} this being very short, arcuated; male hypopygium with the ventral lobe of the basistyle flattened, on outer portion with strong retrorse setae; basal dististyle elongate, the proximal half or stem slender, thence dilated into a blade that terminates in a long straight spine; on upper edge of the expanded portion with a broad flattened flange.

Male.—Length, about 3 mm.; wing, 3·5 mm.

Head brown; palpi darker. Antennae broken.

General coloration of the entire body brown, the mesonotum darker. Legs broken. Wings with a weak brownish tinge, the veins pale brown; macrotrichia somewhat darker. Venation: R_2 lying some distance before the level of *r-m*, R_{2+3} thus relatively short, strongly arcuated; petiole of cell M_3 about three times the short straight *m-cu*; vein *2nd A* relatively short, ending some distance before *m-cu*.

Male hypopygium (fig. 34) with the ventral lobe of the basistyle, *b*, flattened, on outer portion with conspicuous retrorsed setae, those on outer portion short and stout, the inner ones progressively longer, the longest fully half the length of the lobe; near base of outer dististyle a very small oval lobe with delicate setulae. Basal dististyle, *bd*, elongate, the basal half or stem slender, thence dilated into a blade that terminates in a long straight spine, on upper edge of the expanded portion with a broad flattened blade or flange, all of the margins of distal portion provided with scattered teeth and spines of various sizes. Outer dististyle with the base long-extended, at outer end terminating in a slender gently curved black hook or spine. Phallosomic structure with numerous very delicate setulae.

Holotype, ♂, on microscope slide, St. Louis, altitude 100 ft., November 11, 1945 (*Herron*). Paratopotypes, 4 broken ♂, November 4, 1945 (*Herron*).

Compared with all of the very numerous species in Australia, New Zealand and New Guinea, the present fly is entirely distinct in the structure of the male hypopygium.

Molophilus (**Molophilus**) **ordinarius** sp. n.

Belongs to the *plagiatus* group; general coloration yellow, virtually unpatterned; antennae short, yellow; wings light yellow, veins pale and indistinct; male hypopygium with the beak of the basistyle very slender; outer dististyle divided at apex into two unequal arms, the lower one a more flattened blade; basal dististyle a simple nearly straight rod

that narrows very gradually to the tip, the outer portion with scattered appressed spinulae, including a concentration of three or four at the extreme tip.

Male.—Length, about 3 mm.; wing, about 3·5 mm.

Rostrum yellow, palpi a trifle darker. Antennae yellow, broken beyond the fourth segment but evidently short. Head light yellow.

Thorax almost uniformly yellow, the notum scarcely darker than the pleura. Halteres pale. Legs with the coxae and trocahanters yellow; remainder of legs broken. Wings light yellow, the veins a trifle darker. Venation very difficult to determine in the slide mount; vein *2nd A* long and gently sinuous.

Abdomen, including hypopygium, yellow. Male hypopygium (fig. 35) with the beak of basistyle, *b*, very slender, surrounded at base by a concentration of strong setae and a single small spinous point. Outer dististyle divided at apex into two unequal arms, the lower a more flattened blade. Basal dististyle, *bd*, a simple nearly straight rod that narrows very gradually to the tip, the outer portion with microscopic appressed spinulae, with three or four of these crowded at the extreme tip; surface of style more or less distinctly ribbed.

Holotype, ♂, Paita, September 16, 1945 (*Herron*).

Molophilus (*Molophilus*) *ordinarius* is the first member of the *plagiatus* group to be found in New Caledonia. In the general type of structure of the male hypopygium it much resembles species of the group in Australia and New Zealand, including the typical *plagiatus* Alexander, differing from all in the coloration and in the details of structure of the male hypopygium, especially of the basal dististyle.

Styringomyia Loew.

Styringomyia Loew, 1845, *Dipterol. Beitr.* **1** : 6.

Styringomyia neocaledoniae sp. n.

General coloration of mesonotum brownish black with a conspicuous yellow central area; wings with a strong brownish suffusion of posterior two-thirds, the costal portion yellow; abdomen uniformly dark brown, unpatterned; male hypopygium with the basistyle bi-spinous; outer dististyle unusually broad, the upper portion of the blade with abundant retrorsed setae; intermediate style a broadly expanded blade, with similar retrorsed setae.

Male.—Length, about 7 mm.; wing, about 4·2 mm.

Rostrum yellow, palpi pale brown. Antennae with the scape darkened above, obscure yellow beneath; remainder of organ broken. Head light yellow, the sides of the posterior vertex adjoining the eyes conspicuously infuscated; vestiture of head weak, proclinate.

Pronotum medially restrictedly obscure yellow, more infuscated on sides; pronotal setae conspicuous. Mesonotum with a conspicuous central yellow area, including the median region of praescutum, most of the scutum, including the lobes, and the scutelleum; remainder of notum infuscated, especially conspicuous as broad margins to the central praescutal stripe; mediotergite darkened, with vague indications of a very delicate central line; vestiture of notum consisting of delicate unmodified setae only. Pleura and pleurotergite chiefly yellow, unpatterned. Halteres with the stem yellow, knobs broken. Legs with the coxae and trochanters yellow; remainder of legs broken. Wings (fig. 33) with a strong brownish suffusion on posterior two-thirds or more, the costal third, especially in the outer radial field, more yellowed; a broad darker brown seam for almost the whole length of vein *Cu*; veins brown, yellow in the flavous portions, including *C*. Venation: Anterior branch of *Rs* oblique; cell *2nd* M_2 barely sessile; *m-cu* about its own length beyond the fork of *M*; vein *2nd A* curved gently into the margin, without spur or angulation.

Abdomen dark brown, unpatterned. Male hypopygium (fig. 36) with the apex of tergite, *9t*, broad, terminating in a setuliferous lobe that is subtended on either side by a small ear-like lobule. Ninth sternite, *9s*, truncated at tip, each outer apical angle with a long slender seta. Basistyle, *b*, terminating in two modified setae. Outer dististyle, *od*, unusually broad, bearing a long strong apical bristle, the upper portion of the blade with abundant retrorsed setae; intermediate style a broadly expanded blade, similarly provided with conspicuous retrorsed setae. What seems to represent the inner style appears as a slender sinuous black rod that narrows to a slender spine, the margin with a few strong setae.

Holotype, ♂, St. Louis, November 11, 1945 (*Herron*). Paratype, ♂, Mont Mou, altitude 900 ft., February, 1947 (*Garrigou*).

This entirely distinct species of *Styringomyia* is the first representative of the genus from New Caledonia. The species falls in a group of forms that have the basistyle of the male hypopygium bispinous, this group including *Styringomyia armata* Edwards, and many other species. The present fly is well distinguished by the very peculiar conformation of the dististyles.

Bibliography.

Alexander, C. P., 1929, New or little-known Tipulidae from New Caledonia and Samoa. *Encycl. Ent., Dipt.* **5** : 83–92, 8 figs.

——, 1931, Crane-flies of the Baltic Amber (Diptera). *Bernstein-Forsch.* **2**: 1–135, 169 figs.

——, 1932, Check list of the Tipulidae of Oceania. *Occ. Pap. Bishop. Mus., Honoulu* **9** (21) : 1–12.

——, 1934*a*, New or little-known Tipulidae from Eastern Asia (Diptera), XIX. *Philipp. J. Sci.* **54** : 309–342, 3 pls.

——, 1934*b*, New or little-known Tipulidae from Eastern Asia (Diptera), XX. *Ibid.* **54** : 433–471, 2 pls.

——, 1945, New or little-known Tipulidae from New Caledonia (Diptera). *Proc. Hawaii. ent. Soc.* **12** : 235–244, 10 figs.

Forel, Auguste, 1928, *The social world of the ants compared with that of man* **1** : 1–551.

Mann, William M., 1921, The ants of the Fiji Islands. *Bull. Mus. comp. Zool. Harv.* **64** : 405.

Mayr, Ernst, 1939*a*, Borders and subdivisions of the Polynesian region as based on our knowledge of the distribution of birds. *Proc. Sixth Pacific Sci. Congr.* **4** : 191–195.

——, 1939*b*, The origin and the history of the bird fauna of Polynesia. *Ibid.* **4** : 197–216.

——, 1944, The birds of Timor and Sumba. *Bull. Amer. Mus. nat. Hist.* **83**: 123–194, 4 figs.

Sarasin, Fritz, 1925, Nova Caledonia. Forschungen in Neu-Caledonien und auf den Loyalty-inseln. A. *Zoologie* **4** : 160.

Tillyard, R. J., 1917, *The biology of dragonflies* (*Odonata or Paraneuroptera*), pp. 396, 4 pls. Cambridge.

Williams, F. X., 1943, Mosquitoes and some other noxious flies that occur in New Caledonia. *Hawaii. Plant. Rec.* **47** : 205–222, 15 figs.

——, 1945, The aculeate wasps of New Caledonia, with natural history notes. *Proc. Hawaii. ent. Soc.* **12** : 407–452, 18 figs.