XXV.—ANNOTATED CATALOGUE OF ORIENTAL *CULICIDÆ*

By E. BRUNETTI.

INTRODUCTION.

IN presenting this Catalogue I desire to mention that its preparation has been entirely a matter of compilation, and that I do not hold myself responsible for the validity of either the genera or species contained herein As a matter of fact, not having studied the *Culicidæ* except to a most limited extent, I should not feel competent either to support or contest the views of such experienced students of the group as those upon whose labours the present work is, in the main, compiled. A casual examination, however, of the slender characters upon which many of the recent genera and species are established, coupled with the fact that a large number of the latter have been described from single specimens only, leads me to the presumption that a few more years' careful study of the family is more likely to result in the reduction than otherwise of the total number of what to-day are regarded as distinct species. This is, of course, quite apart from new species to be hereafter discovered.[1]

The object of the Catalogue is to provide a systematic list of the mosquitoes recorded from the Oriental Region, and therefore, the comments are confined to questions of synonymy, or notes of general interest, and do not touch upon either of those vast sides of the subject, the biological and the medical. Brief information regarding the life-history, if known, and bare statements regarding the power, or otherwise, of any particular species to convey malaria, will be found; but detailed reports of experiments or researches of an entirely medical or bacteriological nature, would be out of place in a purely systematic list. Mr. Theobald's excellent monograph of this family provides a lengthy list of works and essays, on the medical aspect, and nearly all the recent works of any size afford extensive information respecting life-histories, generally with copious illustrations.

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[1] The collection of the Indian Museum in this group has not yet been worked out, except as regards *Anopheles*, and a few species amongst the other genera. It is of considerable extent, and is being rapidly enlarged by continual acquisitions, and at present is being worked out by Mr. Theobald.

I may add here that during my three years' sojourn in the East I have myself collected upwards of 1,500 specimens of *Culicidæ*.

A general study of this family may be obtained from Robineau Desvoidy's "*Essai sur les Culicides*" (1827), and, more recently Ficalbi's "*Revis. sistem. di famiglia d. Culicidæ*" (1896). Concerning exclusively oriental species, the following list may be found useful, in which is included a limited number of general works on the family, which, by reason of their importance, the student would do well to consult, even if interested only in oriental species.

LITERATURE ON ORIENTAL CULICIDÆ.

Adie, Major, 1905. "Mosquitoes and Malaria in the Ferozepore District." Ind. Medic. Gaz. xl, 5.

Banks, Ch. S., 1906. "A List of Philippine *Culicidæ*, with descriptions of new species." Phil. Jour. Sci. i, pt. 2, pp. 977 to 1005.

Id., 1906. "A new genus and species of *Culicidæ*." Loc. cit. i, pt. 2, p. 780, with plate.

Blanchard, R., 1905. "Les Moustiques."

Christy, C., 1900. "Mosquitoes and Malaria, Summary of Knowledge on the subject."

Ficalbi. (This author's papers are not on Oriental species, but will be found useful.) Bull. So. Ent. It. chiefly in vols. xxi, xxii.

Id. "Revisione sistematica di famiglia della *Culicidæ* Europee."

Giles, 1900. "Handbook of Gnats and Mosquitoes.' 1st Ed.

Id., 1902. 2nd Ed. of same work, much enlarged.

Id., 1901. "Six new species of *Culicidæ* from India." Entom., xxxiv, 192.

Id., 1901. "Descrip. of 4 new spp. of *Anopheles* from India." Ent. Month. Mag., xxxvii, 196.

Id. 1904.[1] Jour. Trop. Med., vii.

James, Capt. S. P., 1889. "The collection of Mosquitoes and their Larvæ." Ind. Medic. Gaz., xxxiv, No. 12.

Id. id., 1902. "Malaria in India." Sci. Mem. Offic. Medic. and Sanit. Dep. Gov. India, No. 2.

James and Liston, 1904. "The *Anopheles* Mosquitoes of India."

Liston, 1901.[1] Ent. Month. Mag., xxxvii.

Id., 1901.[1] Ind. Medic. Gaz.

Ludlow, Miss C. S., 1904. "Concerning some Philippine Mosquitoes." Can. Ent., xxxvi, 69.

Id. id., 1904. "Mosquito Notes" No. 1, loc. cit., 233; No. 2, l.c., 297.

Id. id., 1905. Id. id., No. 3, l.c., xxxvii, 94, 129; No. 4, l.c., 385.

[1] I have been unable to obtain the names of the papers thus referred to.

Neveu Lemaire, 1902. "Classification de la famille de *Culicidæ*."

Patton, W. S., 1905. "The Culicid fauna of the Aden Hinterland." Jour. Bomb. Nat. His. So. xvi, 623 to 637 with 4 plates and map.

Robineau Desvoidy, 1827. "Essai sur la tribu des *Culicidæ*." Mem. So. l'Hist. Nat. Paris, iii.

Theobald, F. V., 1900. "Report on the collections of Mosquitoes received at the British Museum."

Id., 1901. "Monograph of the *Culicidæ* of the World," vols. i, ii.

Id., 1903. Id., vol. iii.

Id., 1902. "A short descr. of the *Culicidæ* of India; with descr. of new spp. of *Anopheles*." Proc. Roy. So. Lond., lxix, 367 to 394 with 1 plate.

Id., 1902. Jour. Trop. Medicine, v.

Id., 1903. "New *Culicidæ* from the Federated Malay States." Entom. xxxvi, 256.

Id., 1904. Id. (continuation). Entom., xxxvii, pp. 12, 36, 77, 111, 163, 211, 236.

Id., 1905. "Some new Mosquitoes from Ceylon." Jour. Bomb. Nat. His. So., xvi, 237 to 249 with 2 plates.

Id., 1905 "A catalogue of the *Culicidæ* in the Hungarian National Museum; with desc. of new gen. and spp." Ann. Mus. Hung. iii, 61 to 120, with 4 plates.

Id., 1905. Genera Insectorum; Fascicule 26. *Culicidæ*.

Mr. Theobald's "Monograph of the *Culicidæ* of the World" (in 3 vols.), from its magnitude holds prior place in the literature of this family. Volumes i and ii appeared in 1901, and contained, besides about 400 pages each of text, liberally augmented by figures, 37 plates (i to xxxvii) (bound up in a separate volume), each plate giving coloured figures of the full insects of four species. Five additional plates marked A to E gave photographic reproductions of wing-scales. At the beginning of vol. i is shown how to mount and examine a mosquito. The first 60 pages give endless information regarding structure, life-history, food, habits, pairing, hybernation, natural enemies, geographical distribution, etc. From p. 84 the malarial aspect of the subject is treated of. On p. 97 is a synoptic table of sub-families and genera followed by a list of the world's species (up to 1901); those present in the British

[1] I have been unable to obtain the names of the papers thus referred to.

Museum collection being marked. Further lists of species follow, arranged according to their geographical distribution. Volume iii (1903) gives 17 more plates of photos of wings and wing-scales; the last two, however, being of larvæ and pupæ.

In Fascicule No. 26 of the "Genera Insectorum" (1905), Mr. Theobald gives a table of sub-families, admitting eight, as follows: *Anophelinæ, Megarhinæ, Toxorhynchitinæ, Culicinæ, Joblotinæ, Ædeomyinæ, Heptaphlebomyinæ* and *Corethrinæ*. Sixty-seven genera (described) are recognised, containing slightly over 500 species, being the total number known including a few new ones. He also gives 2 coloured plates showing 24 full insects.

Lieutenant-Colonel Giles's work, "Handbook of Gnats, or Mosquitoes" is a valuable one. First published in 1900, it attained a second edition in 1902. Chapter i (2nd Ed.), concerns the position and terminology of the *Culicidæ*; chap. ii, collecting and preserving; chaps. iii to vi, the anatomy of the larva, pupa and adult, with many figures; chap. vii, life-history. Plate vi gives photos of living *Anopheles* and *Culex* resting on glass. Conditions influencing prevalence is treated of on p. 152, and a valuable diagram is fig. 38 (facing p. 256), giving a key to generic distinctions based on the characters of the scales.

Although confined to *Anopheles* (sensu latu), Messrs. James and Liston's "*Anopheles* Mosquitoes of India" is also of great value, if only for the splendid plates. The earlier part deals with general notes, eggs, larvæ (figured), habitats, collecting, mounting, preserving, larva-mounting, classified table of *Anopheles* larvæ; distribution and classification of Indian species, and a very excellent diagrammatic plate showing the structure of the various parts of the adult, with their technical terms. The work terminates with 14 other splendid plates (tinted) of large size, illustrative of that number of Indian species.

Mr. Banks' catalogue of the Philippine *Culicidæ* is most useful. Many of the Oriental species, if correctly determined, have an excessively wide range. From Africa (South and West Coast), Mauritius, and Australia, from China, and from Europe, certain species are regarded as identical with forms indigenous to the Orient. It will be noticed that I have included the few Arabian species mentioned in Mr. Patton's paper on the Aden hinterland Culicid fauna; this is because, owing to their wide range of distribution, any of those species may easily occur in India, and not from a desire to include Arabia in the Oriental Region.

To avoid repetition in the catalogue, I append here a brief list of such localities as constantly occur, with particulars added.

Bakloh	4,500 to 5,000 ft. Punjab, Lower Himalayas.
Bhim Tal	4,500 ft. Kumaon Dist., Western Himalayas.
Canara District	On Goa Frontier, W Coast of India, S. of Bombay.
Cavite	Close to Manila (Luzon, Phil. Islands).
Coonoor	6,000 ft. Nilgiri Hills, Madras Presidency.

Dacca	Eastern Bengal.
Dindings	Straits Settlements.
Ellichpur	Berar, Central India.
Ferozepore	Punjab.
Fort McKinley	Luzon, Phil. Islands.
Goa	District on West Coast of India.
Gonda	N. India, S. of Nepal.
Jalpaiguri	N. Bengal, a little south of Darjiling.
Jeypore	State in Madras Presidency.
Jhansi	North-West Provinces, India.
Jolo Island	Philippines.
Karachi	City on extreme West Coast of India, near Baluchistan.
Karwar	Coast Town, Bombay Presidency.
Kuala Lumpur	Capital of Selangor State (Federated Malay States).
Kurseong	5,000 ft. South of Darjiling.
Lushai Hills	On the N.-E. Indian Frontier of Assam.
Makerian	Hoshiarpur District, Punjab.
Mian Mir	Punjab, about 6 miles from Lahore.
Mussoorie	6,000—7,000 ft. Punjab Himalayas, near Simla.
Nagpur	District in Central Provinces, India.
Naini Tal	6,400 ft. Kumaon Dist., W Himalayas.
Negros (Negros Occidental)	Island in the Philippines.
Nilgiri Hills	Madras Presidency.
Old Calabar	West Coast of North Africa.
Orissa	East Coast India.
Pampanga	One of the Philippine Islands.
Pangasinan	One of the Philippine Islands.
Peradeniya	Ceylon.
Perak	Federated Malay States.
Port Canning	30 miles from Calcutta, on Matla River.
Purneah	North Bengal.
Quilon	Coast town in Travancore State, extreme S. of India.
Ranikhet (Reneghat)	4,000 ft. North-West Provinces, India.
Rizal	Near Manila.
Selangor	Federated Malay States.
Shahjahanpur	North-West Provinces, India.
Shaohyling	China.
Simla	7,000 ft. Western Himalayas.
Sylhet	District in Assam ; adjoining Darjiling.
Taiping	Capital of Perak Federated Malay States
Trincomalee	(Hot Wells) East Coast of Ceylon.

N.B.—In Messrs. James and Liston's "*Anopheles* Mosquitoes of India," their references to Jeypore I infer to relate to that city and State in the Madras Presidency, from their spelling of the name.

There is, however, another town and state of the same name, in the Rajputana District of N.-W. India, but this latter place is usually spelt Jaipur.

N.B.—In Mr. Theobald's Monograph, the following data appear, attached to a number of species: "Perak (Wray), 22nd November 1899 and 21st December 1899." As it is not obvious whether the dates refer to two separate days only, or are intended to include the intervening period between them, I have omitted them from my catalogue.

It will be seen that I have admitted four sub-families only,—*Anophelinæ*, *Culicinæ*, *Ædeomyinæ*, and *Corethrinæ*,—and I am strongly inclined to the opinion that the first two would be in every way sufficient. It has not been considered necessary to include every reference known, and cases where simply the name of a species is mentioned, have always been avoided. It has, however, been my object to include all possible diagrams or plates, and to give all the dates and localities available.

I desire to express my obligations to Dr. Annandale of the Indian Museum for his permission to use the Museum Library, without which the compilation of this catalogue would have been impossible.

CATALOGUE.

Sub. Fam. **ANOPHELINÆ.**

ANOPHELES Meig., 1818. (sensu strictu)

Sys. Besch., i, 10; pl. x, 5, 6.

Macq.	1834,	Hist. Nat. Dip., i, 32.
Wlk.	1848,	List Dip. Brit. Mus., i, 9.
Sch.	1864,	F. Austr., ii, 624.
Wulp	1877,	Dip. Neer., 329.
Skuse	1889,	Pr. Linn. So., N.S. Wales, p. 1751
Ficalbi	1896,	Bull. So. Ent. It., 221.
Theob.	1901,	Mon. Culic., i, 115 (sensu latu).
Id.	1903,	Loc. cit., iii, 11 (sensu stricto).
Giles	1902,	Handbk., 2nd Ed., 283 (as restricted by Theobald); table of spp. p. 289.
Theob.	1902,	Proc. Roy. So. Lond., lxix, 368; table of Indian spp.
Theob.	1905,	Gen. Ins. Fasc. 26, p. 6.

Giles in "Handbook," 2nd Ed., 283, gives as a reference of "*Anopheles* as restricted by Theobald," Theob. Mon. Culic., i, 115; but this is incorrect. That reference is of the genus in its wide (Meigen's) sense; as Theobald had not created his other genera till 1902. All the *Anopheles* in the first volume of the Monograph are placed under "*Anopheles*" genus. Theobald's first reference in that work to the restricted genus is in vol. iii, p. 11. Most of the new genera were published in the "Jour. Trop. Med." (1902), vol. v.

A vast amount of information on the life-histories and habits of the species of this genus may be obtained from the recent works. Mr. Theobald, in Monog. Culic., i, 115, gives general information; a list of districts from which various species of *Anopheles* have been received and recorded by the British Museum. On p. 118 is a map of the geographical distribution of the genus, on p. 120 a synoptic table of the world's species up to 1901. In vol. iii, p. 107, is a list of species arranged according to the countries they inhabit; on p. 1 a chart, comparing the relative frequency of *Anophelina* and *Culicina*. Plate v gives wing-scales of *Anophelina*; p. 14 the differences between the ova and larvæ of the two groups *Anophelina* and *Culicina*.

1. **A. aitkenii** James in Theob., 1903.

Theob. Mono. Culic. iii, 22 ♀

James and Liston, Anoph. Mosq. Ind. 119, pl. ix, 3, wing-scales; pl. xiii, larva figs. and wing.

LOCALITIES: Goa Frontier [*Aitken*] Karwar [*Aitken, Dr. Cogill*].

2. **A. arabiensis** Patton, 1905.

Jour. Bomb. So., xvi, 623 ♂ ♀; pl. A, wing, palpus, egg.

"The commonest species in the district" (Aden hinterland) [Patton].

The larva breeds in pools, streams and wells, apparently breeding at different times of the year in different localities.

The adult is certainly a malaria-transmitter, and, as far as the writer (Patton) knows, is the only certain one under natural conditions in this district.

LOCALITY: Aden hinterland [*Patton*].

3. **A. dthali** Patton, 1905.

Jour. Bomb. So., xvi, 627 ♂ ♀; pl. A, wing, palpus, egg.

A free biter, and probably a malaria-carrier; found breeding all round the native camps (alt. 5,000 feet).

LOCALITY: Aden hinterland [*Patton*].

4. **A. gigas** Giles, 1901.

Ent. Month. Mag., xxxvii, 196 ♂ ♀

Theob. Mon. Culic., ii, 308 ♂ ♀

James and Liston, Anoph. Mosq. Ind. 118 (Theob.'s desc. copied).

Giles Hdbk., 2nd Ed., 316 ♂ ♀; pl. x, 2, wing ♂ ♀

Types in British Museum.

The larva appears to prefer clear, shallow water, and the species is said to be not rare in the hills, although I can only find one definite reference.

LOCALITY: Coonoor (5,000 to 6,000 feet) in the Nilgiri Hills [*Price*].

5. A. immaculatus Theob., 1903.

Mon. Culic., iii, 23 ♀

James (1902) Sci. Mem. Ind. No. 2, 35.
James and Liston, Anoph. Mosq. Ind., 120.

This species was *named* by James in the "Sci. Mem. Ind." (1902), but *not described* there, as the words "wings entirely unspotted, legs unbanded" cannot be considered a description. Theobald first *described* it in his "Monog., iii, 23" from a single perfect ♀, adding as a locality "India, evidently from Goa." However, in James and Liston's "Anoph. Mosq. Ind.," they say (p. 120) "Mr. Theobald says the specimen is evidently from Goa, and that it was given him by Capt. Liston. This is incorrect. It was captured at Ennur, a small village on the East Coast, about ten miles from Madras, and sent to Mr. Theobald by Dr. Stephens." The ♂ is unknown; it is distinct from all other *Anopheles* by the unspotted, yellowish wings, and will probably require the erection of a new genus.

LOCALITIES: Ennur (East Coast, near Madras) [*James and Liston*].

6. A. lindesayii Giles, 1900.

Hdbk. Gnats, 1st Ed., 166 ♀

Giles l.c., 2nd Ed., 323 ♀; pl. x, 8, wing ♀.
Theob. Mon. Culic, i., 203; pl. v, 19 ♀ Full ins. col.
James and Liston, Anoph. Mosq. Ind., 117. Col. pl. xv, full ins. ♀

I find no references to this species from other than hill localities. Dr. Christophers has studied the larva. Capt. James found it breeding in natural pools along with *Nyssorhynchus maculatus* Theob., at Raneghat, and Dr. Annandale found it breeding in water butts close to the houses of Europeans at Bhim Tal in September.

LOCALITIES: Bakloh (Punjab, July, 4,585 feet) [*Lindesay*]; Naini Tal (6,500 to 7,000 feet) [*Giles*]; Kurseong, Mussoorie, Raneghat (4,000 ft.) [*James*]; Bhim Tal (4,500 feet, Sept. 1906) [*Annandale*].

7. A. wellcomei Theob., 1904.

Theob. Rep. Gordon Coll. Labor. Sudan, p. 64.

LOCALITIES: Aden hinterland and Sudan.

MYZOMYIA Blanchard, 1902.

Comp. rend. Soc. Biol. Paris, xxiii, 795.

nom. nov. for *Grassia* Theob. preoc. Fisch., 1885.

There is also a *Grasia* Mich., 1854, in Echinodermata.
Grassia Theob., 1902, Jour. Trop. Med., ii, 181.
Myzomyia Theob. Mon. Culic., iii, 24.
Id. *id.* Gen. Ins. Fasc. 26, p. 7.

The larvæ in this genus are mostly found in flowing water, more rarely in ponds or stagnant water, except *rossii* and a non-oriental species, *superpictus* Grassi.

1. M. aconita Donitz, 1902.

Beit. Kennt. 3, d. Anoph., p. 70, ♀

Theob. Mon. Culic., iii, 30, fig. (p. 31), wing ♀

Theobald's description is a translation of Donitz's, whose description was apparently drawn up from a unique ♀ in spirits.

LOCALITIES: Kajoe Tanam, Willen Is., Soekaboemi (Java) [*Donitz*].

2. M. albirostris Theob., 1903.

Mon. Culic., iii, 24 ♂ ♀ Fig. 11, p. 25, palpi and proboscis.
Described from a perfect ♂ and ♀

LOCALITY: Malay States (May) [*Durham*].

3. M. azriki Patton, 1905.

Jour. Bomb. So., xvi, 630 ♂ ♀ Pl. C, wing, palpus.

Patton says it is a wild species breeding in pools with *tibani* Patton, and that it is closely related to "*turklandi* Liston," but I know of no such species as the latter. Perhaps he means *turkhudi* Liston.

LOCALITY: Azriki, (Aden hinterland, 5,000 ft.) [*Patton*].

4. M. culicifacies Giles, 1901.

Ent. Month. Mag., xxxvii, 197 ♀ (*Anopheles* id.).

N.B.—The ♂ in above reference = *turkhudi* Liston ♂

Anoph. culicifacies ♀ non ♂ Theob. Mon. Culic., ii, 309 (t. Th. l.c., iii, 48).
Id. *id.* James & Liston, Anoph. Mosq. Ind. 106, pl. ix, 2, wing scales; pl. viii, 1, larva figs.; col. pl. xi, full ins. ♀
Id. *id.* ♀ non ♂ Giles, Handbk., 2nd Ed., 317; pl. ix, 12 ♂ ♀

Myzomyia culicifacies ♀ Theob. Pr. Roy. So. Lond., lxix, 379.
Id. *id.* ♀ Theob. Mon. Culic., iii, 39, fig. (p. 40) frontal larva hairs; pl. iii, wing, pl. viii, wing scales.

Anoph. listoni Giles, 1901, Ent. Month. Mag., xxxvii, 197 ♂ ♀.
Id. *id.* Giles, Handbk., 2nd Ed., 319 ♂ ♀; pl. x, 4, wing ♂ ♀, head ♂ ♀
Id. *id.* ♀ Theob. Mon. Culic., ii, 311 (App.).
Id. *indica* Theob., 1901, Mon. Culic., i, 183 ♀
Id. *indicus* Giles, Handbk., 2nd Ed., 320 ♀

Type in British Museum.

A common and well distributed species throughout India, the larva breeding freely in canals, streams, ditches and irrigation watercourses in the Punjab throughout the year, although the adults only occur there (in houses) from March to December. In the Deccan it is commonly found throughout the year in river beds, and in S. India it is common in rice fields and pools.

Experiments show that the three kinds of malaria parasites readily develop in it, and Dr. James states that it has been proved to carry malaria in Mian Mir and Ennur.

This species assumes the characteristic position of *Culex* when at rest, and is related to *listoni*, and *jeyporensis* James.

LOCALITIES: Madras (Dec.) [*Cornwall*]; Ferozepore, nearly all the year except Jan. and Feb. [*Adie*]; Rajmahal (N. Bengal) 31-vii-1907 [Ind. Museum]; Armageon (E. Coast, India) [*James*]; Ellichpur (Berar, India) [*Liston*]; Etawah, (N.-W. Prov.); Hoshangabad (Cent. Prov.); Mian Mir; Nagpur, Jeypur State.

5. **M. elegans** James in Theob., 1903.

Mon. Culic., iii, 51, ♀ fig. 28, wing scales, cross veins; fig. 29, wing.

Anoph. elegans James and Liston. Anoph. Mosq. Ind. 82 ♀. pl. ix, 4, wing scales: pl. xii, wing, palpus, leg, larva.

This species is considered as only a variety of *leucophyrus* Donitz, by James and Liston, but Theobald considers it distinct. It has been bred by Dr. Cogill from larva from pools and jungle springs in Karwar. The adults are said not to frequent houses. The ♂ is unknown, and the type is in the British Museum.

LOCALITY: Karwar (April) [*Cogill*].

6. **M. funesta** Giles, 1900.

Jour. Trop. Med., ii, 50 (*Anopheles* id.).

Anopheles *id.* Giles Handbk., 2nd Ed., 318, ♂ ♀; pl. x, 3, wing ♂ ♀, claws ♂, head ♀

Anopheles funestus Theob. Mon. Culic., i, 178 ♂ ♀ ; fig. (p. 53) cross veins ; fig. (p. 180), genitalia ♂, fore ungues ♂, cross veins ; pl. iv, 13 ♀, full ins. col.
Myzomyia id. Theob. l.c., iii, 34, pl. ii, wing ♀
Id. id. Theob. Gen. Ins. Fasc. 26, pl. i, 2 ♀, full ins. col.

Two varieties from West Africa (Gambia), the home of the species, are known, both taken by Dr. Dutton.

var. *umbrosa* Theob. Mon. Culic., iii, 34 ; pl. ii, wing ♀

var. *subumbrosa* Theob. Mon. Culic., iii, 34 ; pl. ii, wing ♀

This latter variety has considerable resemblance to *listoni* Liston.

? *kumasii* Chalmers. Lancet, 1900 (Novem.) ♂ ♀ (*Anopheles* id.).

This latter description is repeated in Theob. Mon. Culic., i, 214 ♂ ♀, where the author adds, "I believe to be a new species. It might, however, be a var. of *A. funestus.*"

Practically an African species.

Taken in dwelling-houses at Kumasi ; Ashanti, where Dr. Chalmers found the larvæ on the margin of the marsh surrounding that place. Abundant on the Gambian Coast, and at the Cape (near Bathurst), the larva being found in rice swamps. It occurs in November in Lagos and in December in Gambia, and Giles reports it from British Central Africa at an altitude of 5,600 feet.

It figures in this Catalogue only on the authority of Banks, although it has been doubtfully recorded from the Philippines before.

LOCALITY : Pampanga (Phil. Is.) [*Banks*].

7. **M. jehafi** Patton, 1905.

Jour. Bomb. So., xvi, 630 ♂ ♀ ; pl. C, wing, egg, palpus ♂ ♀

The eggs were found in springs at Dthali, Arabia, and the species (which appears to be a local one) was bred, and found to bite freely.

LOCALITIES : Jehaf and Dthali 5,000 ft. (Aden hinterland) [*Patton*].

8. **M. leptomeres** Theob., 1903.

Mon. Culic., iii, 38 ♀

Described from a single ♀
Locality : India [*Christophers*].

9. **M. leucophyrus** Donitz, 1901.

Insectenborse, v, 37 ♀ (*Anopheles*).

Theob. Mon. Culic., ii, 307 (*App.*) ♀
James & Liston, Anoph. Mosq. Ind., 82.
Giles Handbk., 2nd Ed., 312 ; fig. 44, wing.

James and Liston regard *elegans* James. (*loc. cit.*) as a variety of this species. However, Theobald considers *elegans* a valid species.

LOCALITIES: Kajoe Janam (Sumatra); Moerah Teweh (Borneo) [*Donitz*].

10. M. listoni Liston, 1901.

Ind. Med. Gaz., xxxvi, 12 ♀ (*Anopheles* id.).

non listoni ♀ *Giles.*

Theob. Mon. Culic., iii, 27 ♀ ; fig. 12, palpus ♂ and scale of wing; fig. 13, wing; p. 40, fig. 17, hairs of larva.

Anoph. christophersi Theob., 1902, Pr. Roy. So. Lond., lxix, 378 ♀ ; pl. v, 3, wing ♀ ..

Id. *id.* James & Liston, Anoph. Mosq. Ind., 103; pl. vii, 1, larva figs ; col. pl. x, full ins. ♀

Id. *fluviatilis* Christophers, 1901, in MS.

Id. *id.* James, Sci. Mem. Ind. No. 2, p. 31, fig. 9.

" Described by me in Pr. Roy. So. Lond., lxix, 378 ♀ as *christophersi* from 2 ♀ ♀ sent to that Society by Drs. Christophers and Stephens, but just previously described as Giles's '*Listoni*' by Capt. Liston." (Theob. Mon. Culic., iii, 28.)

The species is very near *culicifacies* Giles, and *jeyporensis* James.

Aitken has studied the larva (*vide* Theob. Monog. iii, 29) which occurs in rice fields and small rocky streams, but abounds most in boggy ground near rice fields.

James and Liston report the larva from clear streamlets with grassy edges, and state definitely that the species is a malaria carrier as proved both by experiment and under natural conditions.

Messrs. Alcock and Adie, in the Proc. Roy. So. Lond., lxxvi, 319, give a short, interesting account of breeding this species from larvæ (collected 7-ii-1905) from the Indian Museum tank. They bred 7 adults from 26 larvæ, the remaining 12 larvæ (placed in a separate vessel) being voraciously devoured by the larva of a very common oriental dragon fly (*Ceriagrion coromandelianum*). The existence of *Listoni* in Calcutta is important, owing to the malaria-carrying powers of this insect. The Malaria Commission found the species absent during their investigations in June, July and August, and attributed the absence of malaria from Calcutta, to the absence during those months of known malaria carriers. Messrs. Alcock and Adie, taking it in December and January (no adults were found in February), will make it desirable for the species to be searched for diligently by other observers.

LOCALITIES: Ellichpur (Berar, India); Nagpur; Bengal Duars; Calcutta (Dec. and Jan.) [*Alcock, Adie*]; Jeypur; Goa; Bombay; Aurangabad (Hyderabad State) [*James*]; The Duars, India [*Christophers*]; Perak [*Wright*]; North Canara District (Goa) [*Aitken*]; Sylhet, 21-i-1905 and 2-ii-1905 [*Hall*].

11. **M. ludlowii** Theob., 1903.

Mon. Culic., iii, 42.

Fig. 19, *b*, palpus ♂ ; fig. 20, wing ♀ ; fig. 21, vars. in wing marks and cross veins ; figs. 22, costal spots.

By far the commonest of the malaria group in the Philippines, breeding readily in salt water around Manila.

LOCALITIES : Pampanga (Phil. Is.) [*Whitmore*] ; Manila [*Banks, Schultze, Wooley*] ; Luzon (April) [*Ludlow*] ; Singapore [*Biro*].

12. **M. mangyana** Banks, 1906.

Phil. Jour. Sci., i, 991 ♀

Described from several ♀ ♀ Type No. 3290 in the Entomological collection, Bureau of Science, Manila. The species is near *ludlowi* Theob.

LOCALITIES : Rio Baco, Chicago (in Mindoro, Phil. Is., May) [*McGregor*].

13. **M. punctulata** Donitz, 1901.

Insectenborse, v, 37.

non Anoph. id. Theob., Mon. Culic., i, 175.

? Anoph. id. James & Liston Anoph. Mosq. Ind. 84 ; pl. xi, wing, palpus, leg.

As the above authors (*loc. cit.*) give " Theob. Monog., i, 175 " as a synonym of their species, and as Theobald's "*Anoph. punctulata* Don." is not that species, but a distinct one, *tessellatus* Theob., I am rather uncertain which species James and Liston had before them at the time of writing.

They add, " very closely resembling *leucophyrus*, and may be a seasonable variety of that species."

LOCALITIES : Kajoe Janam (Sumatra), Moerah Teweh (Borneo) [*Donitz*] ; Friedrich Wilhelmshafen, Stephansort, Astrolabe Bay and Deslac Is. (all Papua) [*Biro*].

Regarding James and Liston's species, these authors give Karwar (in house), Bombay (August, in house)," Straits, Sumatra and Borneo."

N.B.—*Vide* notes under *Myzomyia tessellata* Theob.

14. **M. rossii** Giles, 1899.

Jour. Trop. Med., ii, 63 ♂ ♀ (*Anopheles*).

Anopheles id. Theob. Mon. Culic., i, 154 ♂ ♀
Fig. 37, wing and cross veins; fig. 38, palpus ♂, thorax ♀, costal border ♂ ♀, ungues ♂; pl. A, wing scales ; pl. iii, 10 ♂, 9 ♀, both full ins. col.

Id. id. Giles Handbk., 2nd Ed., 311, ♂ ♀, pl. ix, 11, wing ♂ ♀, claws.

Anopheles rossii James and Liston, Anoph. Mosq. Ind. 109; pl. vi, .1, larva figs.; pl. x, 3, wing scales; col. pl. xii, full ins. ♀

Myzomyia id. Theob. Mon. Culic., iii, 45, fig. 23, wing ♀, figs. (pp. 46, 47) hairs of larva; pl. iii, wing; pl. vi, wing scales.

Anoph. vagus Donitz, 1902, Beit. z. Kennt. Anoph., p. 80.

The larva is easily noticed, often being found in great numbers together, and breeds anywhere in pots, puddles, pools, from running clear water to very foul water, and water containing 2·8 per cent of salt, but Chatterjee found that larvæ from water containing less than half this amount of salt died on being placed in fresh water. The species occurs up to an altitude of 5,000 feet. In Madras it breeds in rice fields nearly all the year round, and James and Liston say the adults are in the habit of frequenting "railway carriages and almost every kind of road conveyance." The former found it abundant in October at Mian Mir, breeding in muddy, shallow pools and tanks, but not in the irrigation canal. In Perak it has been bred during February from larvæ. It is variable and occurs apparently all over India, the Malay Peninsula, South China, the East India Islands and the Philippines. Captain James never found a specimen in a natural state infected with malaria, although he examined nearly 800 from various parts of India, but he proved, that experimentally, *Filaria sanguinis-hominis* would develop in the species (*vide* "Lancet" Aug. 11th, 1900, p. 451). Theobald (Pr. Roy. So. Lond. lxix, 377) also regards it as a non-malaria carrier. It has been recorded from the Philippines by its place in Banks' Catalogue, but he gives no data, nor have I seen any definite record from these Islands.

LOCALITIES: Sylhet (Jan., Feb., Apr., May, June) [*Hall*]; Rajmahal, Bengal (31-vii-1907) [Ind. Museum]; Lucknow (Apr.) [*Giles*]; Mian Mir (Oct., Nov., "very abundant") [*James*]; Mozufferpur (Behar) [*Green*]; Dacca [*Macrae*]; Etawah, N.-W Prov., and Canara District [*Aitken*]; Mukerian (Hoshiarpur, India) [*Datta*]; Madras (Nov. to March) [*Cornwall*]; Quilon (7-iii-1900) [*James*]; Calcutta (April) [*Annandale, Daniels*]; Port Canning (17-iii-1907, 21-vii-1907) [*Annandale*, Dec., "common," *Chatterjee*]; Kuala Lumpur [*Durham*]; Ferozepore (late July to mid. Dec.) [*Adie*]; Perak [*Wray, Wright*]; Penang [*Freer*]; Padang (Sumatra) [*Donitz*]; Singapore (22-vii-1899) [*Hanitsch*]; Jalpaiguri (June 1907); Sambalpur (Cent. Prov.); Bombay.

Sub. species **indefinita** Ludlow, 1904.

Can. Ent., xxxvi, 299 ♀

LOCALITIES: Bayambang in May (Pangasinan, Philippine Islands) [*Chamberlain*]; Mangarin (September), Guimaras Islands (December) (both Philippine Islands).

15. **M. tessellata** Theob., 1901.

Mon. Culic., i, 175 ♀ (as *Anoph. punctulatus* Donitz).

Loc. cit. fig. 49, thorax, wing, hind leg; pl. xxxvii, 148 ♀, full ins. col.

Anoph. tesselatus (lapsus) Giles, Handbk., 2nd Ed., 305 ♀; pl. ix, 7, wing ♀, dorsum of thorax, hind tarsus.

Respecting this species, Mr. Theobald had prepared for his monograph a new species which he had named *tessellatum*, but which, just previous to publication, he considered to be synonymous with *A. punctulata* of Donitz, recently published. He therefore used the description of his species as that of *A. punctulatus* Donitz in Mon. i, 175, and confirmed this opinion in vol. ii, 306 (Appendix), for the sake of those correspondents who already possessed the species under his MS. name. However, in vol. iii, 55, he says that Donitz had informed him that the two species were quite distinct. Therefore, Theobald's description in Mon. i, 175, for what he there called *A. punctulatus* Donitz, stands good as the original description and reference of his own *tessellata*, which now ranks as a good species.

LOCALITIES: Taiping (Straits) in May, 22-xi-1899 and 21-xii-1899 [*Wray*].

16. **M. thorntoni** Ludlow, 1904.

Can. Ent., xxxvi, 69 ♀.

Described from two ♀ ♀ only, and said to be near *M. albirostris*.

LOCALITIES: Cottabato (Mindanao, June, Philippine Islands) [*Thornton*]; Oras (Samar Islands, Philippine Islands).

17. **M. turkhudi** Liston, 1901.

Ind. Med. Gaz. xxxvi, 441 ♀ (*Anopheles turkhudi*).

Anoph. turkhudi Giles, Handbk., 2nd Ed., 320 ♀ (footnote).
Id. *id.* James Sci. Mem. Ind. No. 2, p. 49., fig. 27, wing; fig. 28, larval chars.
Id. *id.* James & Liston, Anoph. Mosq. Ind. 115; pl. viii, 2, larva figs.; col. pl. xiv, full ins. ♀.
Myzomyia *id.* Theob. Mon. Culic. iii, 48 ♀; pl. iii, wing.
Anoph. culicifacies Giles, Ent. Month. Mag., xxxvii, 197.
Id. *id.* ♂ Theob. Mon. Culic., ii, 309.
Id. *id.* Theob. Pr. Royal So. Lond., lxix, 379 ♂, fig. 2 (p. 380) genitalia ♂.
Id. *id.* ♂ Giles, Handbk., 2nd Ed., 317; pl. ix, 12, ♂ ♀.

Dr. Christophers has studied the larva and, under experimental conditions, human malarial parasites will develop in the adult.

LOCALITIES: Ellichpur (Berar, India), Nagpur and Cashmir [*James*]; Andaman Islands [*Maj. Anderson*]; Hoshangabad (Cent. Prov., India); Lahore; Ferozepore, rare [*Adie*].

STETHOMYIA Theob., 1902.

Jour. Trop. Med., v, 181.

Theob. Mon. Culic., iii, 62: pl. viii, wing scales of *S. nimba*, an African species.
Theob. Gen. Ins. Fasc. 26, p. 8.

1. S. culiciformis James and Liston, 1904.

Anoph. Mosq. Ind. 122 ♂, ? ♀ (*Anopheles*); pl. xv, larva figs.

Apparently both sexes are intended to be included in the description, although only the ♂ is specially mentioned. The authors say that Theobald would place it in this genus. Dr. Cogill bred the species at Karwar from larvæ.

LOCALITY: Karwar [*Cogill*].

2. S. fragilis Theob., 1903.

Entom., xxxvi, 257 ♂

Described from two ♂ ♂ bred by Dr. Durham from larvæ found in a clear water jungle pool. Types in British Museum.

LOCALITY: Kuala Lumpur in Dec. and Jan. (Fed. Malay States) [*Durham*].

3. S. pallida Ludlow, 1905.

Can. Ent. xxxvii, 129 ♀

Described from a single ♀, "taken in the woods."

LOCALITY: Pampanga (Luzon) [*Whitmore*].

PYRETOPHORUS Blanchard, 1902.

Comp. rend. So. Biol: Paris, xxiii, 795.

nov. nom. for *Howardia* Theob. preoc. by Dalla Torre in 1897.
Howardia Theob., 1902, Jour. Trop. Med., v, 181.
Pyretophorus Theob. 1903 Mon. Culic., iii, 66.
Id. Theob. Gen. Ins. Fasc. 26, p. 8.

1. P. freerae Banks, 1906.

Phil. Jour. Sci. i, 993 ♀

Type specimen in the Entomological Collection (Type No. 5975) of the Bureau of Science, Manila.

LOCALITY: Manila (Oct.) [*Banks*].

2. P. jeyporensis James, 1902.

Sci. Mem. Ind. No. 2, p. 32 (*Anopheles id.*).
Fig. 11, wing; fig. 12, larval characters.
Pyretophorus id. Theob. Mon. Culic., iii, 66; pl. viii, wing scales, fig. (p. 67) palpus ♂
Anopheles id. James & Liston Anoph. Mosq. Ind. 101; pl. vii, 2, larva figs.; col. pl. ix, full ins. ♀

Near *listoni* and *culicifacies*; the larva living mostly in rice fields, but also in streams.

LOCALITIES: Jeypur State [*Christophers* and *Stephens*]; Jakot (S. India) [*Aitken*]; Nagpur and Bombay.

3. P. minimus Theob., 1901.

Mon. Culic., i, 186 ♀ (*Anopheles*), fig. 55, wing, thorax, cross-veins.
Anopheles. id. Giles Handbk., 2nd Ed., 321 ♀; pl. x, 7, wing ♀, thorax, scale.
Pyretophorus id. Giles, Jour. Trop. Med., vii, 365.
Described from a unique ♀ in Dr. Rees's collection.

LOCALITIES: Pokfulam, Hongkong [*Dr. Rees*]; Pampanga (Luzon) [*Whitmore*].

4. P. philippinensis Ludlow, 1905.

Can. Ent. xxxvii, 135.

LOCALITY: Pampanga (Luzon) [*Whitmore*].

5. P. pitchfordi Giles, 1904.

Jour. Trop. Med., vii, 365.

This species is said (by Banks) to have been reported from Uganda, but I find no reference to that effect.

LOCALITY: Pampanga (Luzon) [*Whitmore*].

MYZORHYNCHUS Blanchard, 1902.

Comp. rend. So. Biol. Paris, xxiii, 795.

nom. nov. for *Rossia* Theob. preocc. Owen 1838 in Mollusca.
Rossia Theob. Jour. Trop. Med., v, 181.
Myzorhynchus Theob. Mon. Culic., iii, 84; pl. v, wing scales.
Id. Theob. gen. Ins. Fasc. 26, p. 9.

The larva of this genus is said to breed mostly in swampy ground.

1. M. albotæniatus Theob., 1903.

Mon. Culic., iii, 88 ♀ pl. i, wing; pl. v, wing scales.

LOCALITY: Perak [*Dr. Wright*].

2. **M. annularis** Wulp, 1884.

Notes Leyden Museum, vi, 249 ♂ ♀ (*Anopheles*), and Tijd. v. Ent., xxviii, 80. Pl. iv, 2 (*Anopheles*).

Theobald, in Mon. Culic. i, 142, makes this a sub-species of *sinensis* Wied., but in vol. iii, 90, he notes his error and states that *his* "*annularis* V d. Wulp" = *vanus* Wlk.

3. **M. barbirostris** Wulp, 1884.

Notes Leyden Museum, vi, 248 ♀ (*Anopheles*), and Tijd. v. Ent., xxviii, 79 ♀; pl. iv, 1 (*Anopheles*).

Anopheles barbirostris Theob. Mon. Culic., i, 146 ♀, fig. 33 head; fig. 24, wing; also see p. 151. Pl. A, wing scales.

Id. *id.* Giles, Handbk., 2nd Ed., 308 ♂ ♀; pl. viii, 13*a*, wing ♂ ♀

Id. *id.* James & Liston, Anoph. Mosq. Ind. 77 ♀, pl. x, i, wing scales; pl. v, larva figs.; col. pl. ii, full ins. ♀

Myzorhynchus id. Theob. Mon. Culic. iii, 86, fig. 25, larva hairs, pl. iii, wing.

Id. *id.* Theob. Gen. Ins. Fasc. 26; pl. i, 3 ♀, full ins. col.

Aitken found the larva amongst grass and weeds in rocky pools, in lily ponds, in the public gardens of Lahore. Not common in houses; Capt. James doubts if it carries disease.

LOCALITIES: Sylhet, Jan., Feb., May, June [*Hall*]; Calcutta [*Annandale*, and 13-xi-1905, bred in the Indian Museum]; Port Canning, Dec. 1906 [*Chatterjee*]; Calcutta outskirts, Lahore and Bombay [*James* and *Liston*]; Canara Dist. [*Aitken*]; Selangor [*Wray*]; Upper Burma, June 1894, and in August [*Watson*]; Kuala Lumpur [*Dr. Durham*]; Mt. Ardjoeno (East Java) [*Hekmeyer*]; Papua [*Biro*]; Shaohyling (China); Pampanga [*Whitmore*]; Rizal [*Banks, Schultze*]; Manila [*Banks*]; Fort McKinley [*Craig*] all in the Phil. Is. Also occurs in (Old Calabar in April) [Annett] West Africa, and in Japan.

4. **M. minutus** Theob., 1903.

Mon. Culic., iii, 91 ♀

Described from a unique from Lahore, taken by Dr. Christophers.

5. **M. nigerrimus** Giles, 1900.

Handbk., 1st Ed., 161 ♀ (*Anopheles*).

Theob. Mon. Culic., i, 150.

Giles Handbk., 2nd Ed., 306.

James & Liston Anoph. Mosq. Ind., 79 ♀; col. pl. iii full ins. col.

The larva has been found in deep, shady pools, amongst grass and weed. The adults are said to be less common in houses, and James and Liston assert that the *Filaria bancrofti* can develop in this species. They also are inclined to think that, in addition to *nigerrimus*, *vanus*, *minutus*, *indiensis*, *pseudopictus*, *alboannulatus* and *sinensis* may all represent the same species.

LOCALITIES: Naini Tal [*Giles*]; Sylhet (Jan., Feb., May, June) [*Hall*]; Calcutta (7-iv-1899) [*Alcock* and *Daniels*], 7-vii-1907 [*Annandale*]; 22-iii-1907 [*Indian Museum*]; Travancore [*James*]; Port Canning, 6-i-1907 [*Annandale*]; Jalpaiguri [June 1907]. Dacca, Lahore, Madras.

6. **M. plumiger** Donitz, 1901.

Insectenborse, v, 37 (*Anopheles*).

Described by that author from East India and Hongkong.

7. **M. pseudobarbirostris** Ludlow, 1902.

Jour. New Yk. Ent. So., x, 127.

LOCALITIES: Hagonoy (Bulacan) in Luzon (Oct.) [*Dr. Kellogg*]; Cottabato (June) in Mindanao [*Dr. Thornton*]; Pampanga (Luzon) [*Whitmore*].

8. **M. sinensis** Wied., 1828.

Auss. Zweifl. Ins., i, 547 ♂ ♀ (*Anopheles*).

Frnfld. 1867. Ver. zool. bot. Wien., xvii, 449.
Anopheles id. Theob., Mon. Culic. i, 137 ♀; fig. 30, wing scales; pl. xxxvii, 146 ♀, type form, full ins. col.; pl. A, wing scales.
Id. id. Giles, Handbk., 2nd Ed., 305; pl. viii, 9, wing ♀, scales.
Myzorhynchus id. Theob. Mon. Culic. iii, 89, fig. 53, palpus ♀
Id. id. Giles, Jour. Trop. Med. vii, 365.

Mr. Theobald (who does not appear to have met with a ♂, a sex which apparently has not been seen since Wiedemann's original type) gave as sub-species of *sinensis* (*vide* Mon. i, 140 *et seq.*), *pseudopictus* Grassi, Italy; (*Anoph. pictus* Ficalbi); "*annularis* V d. Wulp" ♂ ♀ (= *vanus* Wlk.); *indiensis* Theob. Mon. i, 145, and *nigerrimus* Giles.

In the "Genera Insectorum" he admits *pseudopictus* Grassi, and *nigerrimus* Giles, as good species; but sinks his "*annularis* Wulp" as a synonym of *vanus* Wlk., whilst *indiensis* does not appear; the only species of that name in that work being given as a variety of *Nyssorhynchus maculipalpis* Giles, and apparently has nothing to do with *sinensis* Wied.

James has shown that *Filaria sanguinis hominis* will experimentally develop in this species, the larvæ of which were found by the same observer in deep, natural ponds on swampy ground at some distance from houses in Jalpaiguri.

LOCALITIES: Calcutta and Jalpaiguri [*James*]; Ferozepore [*Adie*]; Shaohyling in June (China) [*Cornford*]; Taipo Pokfulam (China) [*Dr. Rees*]; Foochow (August) [*Rennie*]; Tamsui 2-viii-1899 (Formosa) [*Dr. G. Mackay*]; Pampanga (Luzon) [*Whitmore*].

9. **M. umbrosus** Theob., 1903.

Mon. Culic. iii, 87 ♀; fig. (p. 87) wing.

Taken by Dr. Durham in October at Pahang (Fed. Malay States).

10. **M. vanus** Wlk., 1860.

Pr. Linn. So. Lond. iv, 91 ♀ (*Anopheles id.*).

non annularis Wulp. (*vera*) 1884; Notes Leyden Mus. vi, 249.

" *Annularis* V. Wulp." Theob. Mon. Culic. i, 142 ♂ ♀; fig. 32, head; pl. v, 18 ♀, full ins. col. (as *Anopheles sinensis* Wied., sub-species " *annularis* v. d. Wulp"); pl. A, wing scales (as *sinensis* Wd., sub.-sp. *annularis* v. d. Wulp).

Myzorhynchus sinensis annularis. Theob. Mon. Culic., iii, 90; *vide* also Theob. Mon. Culic. i, 151, for comparisons with other species.

The larva of this species has been studied. (*Vide* Theob. Mon. Culic. iii, fig. 4 (p. 18).)

" Walker's types are very damaged, but enough remains to identify the species." (Theob.)

LOCALITIES: Sambalpur (Cent. Prov. Ind.) [*D. O'C. Murphy*]; Quilon (27-vii-1901) [*James*]; Perak [*Wright*]; Taiping [*Wray*]; Madras [*Cornwall*]; Lahore [*Christophers*]; Penang [*Freer*]; Kuala Lumpur [*Durham*]; Luzon, 7-ix-1901 [*Ludlow*]; Bayembang (Pangasinan, Phil. Is.) [*Chamberlain*]; Manila [*McGregor, Wooley*]; Dindings (Straits).

LOPHOCELOMYIA Theob., 1904.

Entom., xxxvii, 12.

Theob. Gen. Ins. Fasc. 26, p. 10.

" Near *Nyssorhynchus*, but so far I have seen no Anopheline approaching it in general appearance." (Theob.)

1. **L. asiatica** Leicester, 1904.

Entom., xxxvii, 13 ♂ ♀

Types in British Museum. Taken by Dr. Leicester in the "ambang" jungle at Kuala Lumpur in the Federated Malay States.

NYSSORHYNCHUS Blanchard, 1902.

Comp. rend. Soc. Biol. Paris, xxiii, 795.

nom. nov. for *Laverania* Theob., preoc. by Grassi and Feletti, 1900.
Laverania Theob., Jour. Trop. Med.
Nyssorhynchus Theob. Mon. Culic. iii, 92; pl. v, wing-scales.
Id. Theob. Gen. Ins. Fasc. 26, p. 10.

The larvæ are mostly "pot and puddle" breeding species, but some breed in marshes; the adults are mostly domestic, but some are wild. (Theob.)

1. **N. fuliginosus** Giles, 1900.

Handbk., 1st Ed., 160 (*Anopheles*).

Anopheles fuliginosus Giles, Handbk., 2nd Ed., 298 ♂ ♀; pl. viii, 7, wing, palpus ♂ ♀, scutellum scale.
Id. *id.* Theob. Mon. Culic. i, 132 ♀; fig. 27, scutellum and scale; fig. 28, a, wing; pl. i, 3 ♀ full ins. col.
Id. *id.* James. Sci. Mem. Ind. No. 2, fig. 18 (p. 39) larva chars.
Id. *id.* James & Liston, Anoph. Mosq. Ind. 91; pl. v, 2, larva figs; pl. x, 4, wing-scales; col. pl. v, full ins. ♀
Anoph. jamesii Liston, Ind. Med. Gaz. (1901), p. 411.
non jamesii Theob. I, 134.
Anoph. leucopus Donitz, Insectenborse v, 37.
Nyssorhynchus fuliginosus Theob. Mon. Culic., iii, 93.
Var. *pallida* Theob. *loc. cit.* i, 134; fig. 28 *b* (p. 133) wing.

This species is subject to great variety both in wing and leg markings (Theob.). In some places (Calcutta and Nagpur) it is common in houses, whereas in others it is said to seldom visit them.

The larva has been observed by Capt. James and others. In Bombay it is often found in tanks; in Nagpur and Madras in open tanks, also in grassy or weedy ponds; in the Punjab in shady, weedy pools.

Under natural conditions it is non-malarious, but experimentally, parasites have been demonstrated to develop in it (James); although Theobald (Monog., i, 134) said that up to then "experiments with human malaria (crescent and tertian)" had failed.

LOCALITIES: Sylhet (Jan., Feb., May) [*Hall*]; Kurseong 5,000 ft. [*Indian Museum*]; Ferozepore, all the year round except Jan. and Feb. [*Adie*]; Lahore in June [*Giles*]; Nagpur [*Stephens*]; Goa and the "Madras Coast, several places" [*James*]; Chingelput (Madras) [*Cornwall*]; Quilon [*James*]; Calcutta 7-iv-1899 [*Daniels*], 13-xi-1905 [bred in *Indian Museum*], 6-vii-1907 and 2-viii-1907 [*Annandale*]; Dacca [*Lt.-Col. Macrae*]; Behar [*Cornwall, Green*].

2. **N. jamesii** Theob., 1901.

Mon. Culic., i, 134 ♀ (*Anopheles*); pl. i, 2 ♀, full ins. col.

Anopheles jamesii Giles, Handbk., 2nd Ed., 299, ♀

Id. *id.* James Sci. Mem. Ind. No. 2, 41.

Id. *id.* James & Liston, Anoph. Mosq. Ind. 93; col. pl. vi, full ins. ♀

Said to be allied to *maculipalpis*, *theobaldi* and *fuliginosus*, and not to be a common species.

The larva live amongst grass and weeds at the edges of lakes. Captain James reared the species from larvæ in Nagpur.

LOCALITIES: Shahjahanpur in Oct. (Punjab) [*Giles*]; Ferozepore, rare [*Adie*]; Quilon in Feb. and 7-iii-1900 [*James*]; Calcutta, 23-vii-1907 [*Annandale*] Port Canning, Dec. 1906 [*Chatterjee*]; also from Ellichpur in Feb. (Berar), Bombay, Deccan and Ceylon.

3. **N. karwari** James in Theob., 1903.

Theob. Mon. Culic., iii, 102 ♀; l.c. fig. 61 (p. 103) wing.

Anopheles karwari James & Liston, Anoph. Mosq. Ind. 89; pl. xiv, palpus, leg, head, larva; p. 90, fig. of wing.

Near *maculatus*.

LOCALITIES: Karwar in June (Bombay Pres.) [*Cogill*]; Goa in Feb., 2,000 ft. [*Aitken*].

4. **N. maculatus** Theob., 1901.

Mon. Culic., i, 171 ♂ ♀ (*Anopheles maculata*).

Fig. 48, palpus ♂, head ♂, wing, tip of abdomen and various scales.

Anopheles maculatus James, Sci. Mem. Ind. No. 2, 47, fig. 25, wing and leg.

Id. *id.* Giles, Handbk., 2nd Ed., 301 ♂ ♀; pl. ix, 2, head, wing ♂ palpus ♂

Nyssorhynchus id. Theob. Mon. Culic. iii, 96.

Described from two ♀ ♀ in Hongkong. Types in Dr. Rees's collection.

It is very near *theobaldi*, of which James and Liston think it may be a variety. The larva lives in shallow pools and marshy grounds on granite soil near Hongkong. James bred it in March from larvæ found in clear, sandy or rocky pools ; it disappearing in April and May ; and he considers it probably not a malaria carrier. In the Duars, the larva occurs in clear pools in rice fields.

LOCALITIES: Lahore, March, April [*Christophers*]; Kurseong [*James*]; Jalpaiguri (N. Bengal), 13-vii-1907 [*Wallich*]; Jeypur Hill Districts [*James*]; Perak [*Wright*]; Hongkong in Sept. and Oct. [*Rees* and *James*] also from Dindings in Nov. (Straits).

5. **N. maculipalpis** Giles, 1902.

Handbk., 2nd Ed., 279 ♂ (*Anopheles*).

Anopheles maculipalpis James and Liston Anoph. Mosq. Ind. 95, pl. iv, larva figs.; pl. x, 5, wing-scales ; col. pl. vii, full ins. ♀.

Nyssorhynchus id. Theob. Mon. Culic., iii, 96 ♀, fig. 56, antenna ♀, palpus ♀, cross veins ♀ ; pl. ii, two wings ♀; fig. p. 98, hairs of larva.

Var. *indiensis* Theob. Mon. Culic., iii, 99.

Giles described only the ♂, Theobald's description of the ♀ is from a single, nearly perfect, specimen taken by Grandpre and Daruty.

LOCALITIES : India [*Christophers* and *Stephens*]; Nagpur, Karwar, Goa and Travancore [t, *James* and *Liston*]; Bayembang (Pangasinan, Phil. Is.) [*Chamberlain*]. Also frequents Mashonaland and Mauritius.

6. **N. nivipes** Theob., 1903.

Entom. xxxvi, 258 ♂

Near *stephensi* and *maculatus*.

Taken by Dr. Durham in January at Kuala Lumpur in the Federated Malay States.

7. **N. philippinensis** Ludlow, 1902.

Jour. New Yk. Ent. So., x, 128 (*Anopheles*) ; also Jour. Amer Med. Assn. (1902) xxxix, 426.

Occurs at San Jose, Abra, in the Philippines [*Banks*].

8. **N. stephensi** Liston, 1901.

Ind. Med. Gaz., xxxvi, 12 (*Anopheles*).

Anopheles stephensi James, Sci. Mem. Ind. No. 2, 45; fig. 23, wing ; fig. 24, larva chars.

Anopheles stephensi Giles, Handbk., 2nd Ed., 331 ♀ (footnote).
Id. *id.* James ♀ Liston, Anoph. Mosq. Ind. 113; pl. vi, 2, larva figs.; pl. x, 6, wing scales; col. pl. xiii, full ins. ♀
Nyssorhynchus id. Theob. Mon. Culic. iii, 93 ♀; fig. 54, variation in wing marks; fig. 55, wing; figs. pp. 40 and 47, larval hairs.
Anoph. metaboles Theob. Proc. Roy. So. Lond., lxix, 374 ♀; pl. v, 1, wing ♀.

Captain James found it breeding at Mian Mir in water reserves (used only in case of fire), also in Madras City in almost unused wells.

Experimentally, human malaria parasites have been developed in this species.

LOCALITIES: Mian Mir and Madras City [*James*]; Ferozepore, May to mid-Nov. [*Adie*]; Calcutta, 1-viii-1907 [*Annandale*]; Lushai Hills, Assam, 9-vii-1904 [*Capt. Macleod*]; Karachi "common"; Nagpur and Ellichpur (Berar).

9. **N. theobaldi** Giles, 1901.

Ent. Month. Mag., xxxvii, 198 ♀ (*Anopheles*).

Anopheles theobaldi Giles, Handbk., 2nd Ed., 300 ♀
Id. *id.* Theob. Mon. Culic., ii, 311 (App.) ♀
Id. *id.* James & Liston, Anoph. Mosq. Ind., 97; col. pl. viii, full ins. ♀
Nyssorhynchus id. Theob. Mon. Culic., iii, 95.

In the Punjab the larva occurs in rice fields and streams; James and Liston state that experimentally the species will develop malaria parasites.

LOCALITIES: Ellichpur (Berar) [*Liston*]; Shahjahanpur 19-x-1900 (N.-W Prov.) [*Giles*]; Dacca [*Macrae*]; Nagpur [*Stephens*]; Sambalpur [*Murphy*]; Lahore in October, also at Bombay and in the Aden hinterland.

10. **N. tibani** Patton, 1905.

Jour. Bomb. So., xvi, 629 ♂ ♀; pl. B., wing, palpus ♂ ♀, hind leg, egg, head of larva.

The larva breeds in all the rivers and springs up to Jehaf (6,800 ft.), but is found neither in wells, nor near man.

Experiments to develop "*Benign tertian*" failed.

The species is closely related to *theobaldi*.

LOCALITY: Aden hinterland.

11. **N. willmori** James in Theob., 1903.

Theob. Mon. Culic., iii, 100 ♀; fig. 59, palpus ♀, fig. 60, various scales.

Lt. Willmore found the larva in a clear puddle by a spring in Kashmir (4,800 ft.). It is allied to *stephensi* and *maculatus*; Dr. Christophers records it from Lahore.

CELLIA Theob., 1903.

Mon. Culic., iii, 107 ♀
Theob. Gen. Ins. Fasc. 26, p. 11.

"Easily told by their dense coating of irregular scales, totally unlike a typical Anopheles" [*Theob.*], *vide* Theob. Monog., iii; pl. viii, wing scales.

1. **C. pulcherrima** Theob., 1902.

Proc. Roy. So. Lond., lxix, 396 ♀; pl. v, 2 wings ♀
Theob. Mon. Culic., iii, 107.

Anopheles pulcherrima James & Liston Anoph. Mosq. Ind., 86, col. pl. iv, full ins. ♀
Id. *id.* James Sci. Mem. Ind. No. 2, p. 48, fig. 26, wing.
Id. *id.* Giles, Handbk., 2nd Ed., 510 ♀

Type in British Museum.

Theobald's descriptions are from 3 ♀ ♀ sent by Capt. James and Drs. Christophers and Stephens.

The larvæ have been found during September in an overflow pool of an irrigation watercourse at Mian Mir.

"It appears to be one of the few species which can tide over the Punjab winter in the adult condition (James and Liston).

LOCALITIES: Mian Mir [*James*]; Ferozepore, early July to early Dec. [*Adie*]; Goa [*James & Liston*]; Purneah (N. Bengal) 7-viii-1907, in bedroom [*Paiva*].

2. **C. kochi** Donitz, 1901.

Insectenborse, v, 36 (*Anopheles*).

Anopheles kochi Theob. Mon. Culic., i, 174 ♀; pl. iv, 16 ♀, full ins. col.
Anoph. ocellatus Theob. (MS.) l.c., i, 174 (t. Theob., vol. ii, 306).
Id. *id.* Giles, Handbk., 2nd Ed., 315 ♀; pl. ix, 5, wing ♀, dorsum of thorax.

Theobald's description (in Monog. i, 174) was written to apply to his species in MS. named *ocellatus*, but Donitz's species was

published just before, and takes precedence (confirmed by Theob. in vol. ii).

LOCALITIES: Taipang [*Wray*]; Perak [*Wright*]; Singapore [*Biro*]; Sylhet, 4-ii-1905; 7-vi-1905; 31-vii-1905; and 15-xii-1905 [*Hall*]; Padang (Sumatra) and Serang Tjimahi (Java) [*Donitz*]; Philippines.

ALDRICHIA Theob., 1903.

Mon. Culic., iii, 353 (App.).
Theob. Gen. Ins. Fasc. 26, p. 13.

"One of the most marked genera of the Anophelina, the squamose armature of the abdomen exactly resembling *Culex*" (Theob.).

1. A. error Theob., 1903.

Mon. Culic., iii, 353 ♀

Described from a perfect unique specimen. Locality given as "India, probably Calcutta."

BIRONELLA Theob., 1905.

Ann. Mus. Hung., iii, 69.

"Near *Anopheles*."

1. B. gracilis Theob., 1905.

Ann. Mus. Hung., iii, 69 ♂; fig. 3, scales; pl. ii, wing ♂, pl. iii, wing scales ♂ ("♀" lapsus).

The photo, figure of wing scales, in pl. iii, is marked, "♀" This is an error, as in the text, the author distinctly states he could not find this sex present in the Hungarian Museum Collection, in which are the types (3 ♂ ♂) from which the description is taken.

Taken by Biro Dec. 31st, 1900, at Muina in Papua.

"ANOPHELES" sensu latu.

In Mr. Theobald's revision of the family in Genera Insectorum he includes the following three species which he is unable to place in any of the modern genera.

1. Anopheles vincenti Laveran, 1902.

Comp. rend. So. Biol. Paris, xxiii, 993.

Recorded by Laveran from Tonkin.

Theobald's quotation "1901, vol. 53" is, of course, an obvious error for vol. xxiii.

2. Anopheles formosaensis.

To this name, Theobald simply adds Tsuzuki—whether this is the author, and from what locality it comes, or where described he does not say. I have not met with the name of the species elsewhere.

3. Anopheles deceptor Donitz, 1902.

Beit. Kennt. 3. d. Anoph., p. 60.

Recorded from Sumatra. May belong to *Nyssorhynchus*.

There are two other species of "*Anopheles*" not alluded to in Theobald's revision ("Gen. Ins."); these are :—

4. Anopheles culiciformis Cogill, 1903.

Jour. Bomb. So., xv, 333.

Recorded from India.

5. Anopheles subpictus Grassi, 1899.

Atti. R. Accad. Lincei. Rendic., viii, 1.

"India Orientalis." So given in Kertesz's "Catalogue of Diptera" (I. 254), but I have not seen the species mentioned elsewhere.

MEGARHINUS Rob. Desv, 1827.

Ess. Culic. in Mem. Soc. His. Nat. Paris, iii, 412.
Macq. 1827 Hist. Nat. Dipt.
Wlk. 1848 List. Dip. Br. Mus., i, 1.
Skuse 1889 Pr. Linn. So. N. S. Wales, iii, p. 1720.
Theob. 1901 Mon. Culic., i, 215, fig. 63, various parts insect, fig. 64, map of distribution, p. 218, table of species.
Theob. 1905 Gen. Ins. Fasc. 26, p. 12.

1. M. amboinensis Doles., 1857.

Nat. Tijd. Ned. Ind., xvi, 381 ♂ ; pl. v, 5 (*Culex* id.).
Giles, Handbk., 1st Ed., 133 (translation of Doleschall).
Id. id., 2nd Ed., 276.
Theob. Mon. Culic., i, 243 ♂

Not uncommon in the bush in the dry season in Amboina, according to Doleschall. Osten Sacken (Berl. Ent. Zeit., xxvi, 96) questioned if this species was distinct from *immisericors* Wlk., but it is accepted as such by Kertesz (Cat. Dipt.) and Theobald (Gen. Ins.).

An allied species *subulifer* Doleschall (*Culex* id.) is given by Kertesz as a synonym of this species, but Theobald regards it as

the same as *immisericors*, and I therefore follow him as the latest authority in this group. Moreover he thinks the present species may be a *Toxorhynchites*.

LOCALITY: Amboina [*t. Doleschall*].

2. M. lewaldii Ludlow, 1904.

Can. Ent., xxxvi, 223 ♂

The type was bred in the laboratory, but no notes were kept; the specimen is a unique and is perfect. Not mentioned by Theobald in "Genera Insectorum."

LOCALITY: Salog (April), Guimaras Island (Philippines) [*LeWald*].

3. M. minimus Theob., 1905.

Jour. Bomb. So., xvi, 237 ♂; pl. A, fig. 1, palpus, wing, abdomen tip.

Described from a unique ♂ taken in March at Yatiyantota, Ceylon. Theobald ignores this species in the "Gen. Ins."

4. M. splendens Wied., 1819.

Wied. Zool. Mag., iii, 2 (*Culex* id.) ♂
Wied. 1828 Auss. Zweifl., i, 3 (*Culex*). ♂
Macq. Hist. Nat. Dipt., i, 33 (*Culex*).
Sch. 1868 Reise Novara 31 (*Megarhinus*).
Wulp. 1881 Dipt. Mid. Sumatra 8; pl. i, 2, wing.
Theob. Mon. Culic., i, 235 ♀; pl. viii, 31 ♀, full ins. col.
Giles Handbk., 2nd Ed., 271.

Types in Wiedemann's and Westermann's collections.

LOCALITIES: Java [*Wiedemann*]; Sumatra [*Schiner*]; Singapore [*Wallace*]. Rawas, (Mid. Sumatra) and Batavia [*t. Wulp.*].

TOXORHYNCHITES Theob., 1901.

Mon. Culic., i, 244.
Loc. cit. iii, 120, notes on larva, pupa, etc., of non-oriental species.
Theob. Gen. Ins. Fasc. 26, p. 13.

1. T. immisericors Wlk., 1860.

Pr. Linn. So., iv, 90 ♂ (*Megarhina*).

Megarhinus *id.* Theob. Mon. Culic., i, 225 ♂ ♀; pl. vii; 28 ♂, full ins. col. (*Megarhinus* id).; pl. ix, 33 ♀; full ins. col. (*M. gilesii*).
Id. *id.* Giles, Handbk., 2nd Ed., 273.

Toxorhynchites id. Theob. Mon. Culic., iii, 123, fig. 67, larva, pupa.
Megarhinus " *id.* or *amboinensis* Dol." Os. Sack. Berl. Ent. Zeit., xxvi, 96.
Id. or Giles, Handbk. *id.*, 2nd Ed., 273.
Id. gilesii Theob. Mon. Culic., i, 227 ♂ ♀
Id. subulifer Doles. 1857 Nat. Tijd. Ned. Ind., xiv, 382 ; pl. v, 2 (*Culex*).
Id. id. Giles, Handbk., 2nd Ed., 272.
Culex regius Thwaites (1864) Pr. Linn. So. Lond., viii, 102.

This very large and handsome mosquito occurs apparently all over the Oriental region, in parts of India being known as the " stinging elephant mosquito." Mr. Ernest Green of Ceylon has bred it from larvæ living in the collected water in stems of the giant bamboo. The larvæ prey solely on the larvæ of other *Culicidæ*.

The adult shows some variation, and it appears fairly common in Calcutta in particular spots in gardens and on walls and tree trunks during July and August, and both sexes have been taken there frequently by Dr. Annandale. I captured a specimen in a wine shop in Calcutta, July 1904, the only one I have seen alive.

LOCALITIES : Calcutta, July, August [*Annandale and others*] ; Upper Burma [*Watson*] ; Sikhim, 1,800 feet, June [*Dudgeon*] ; Bhim Tal, Sept. 1906 [*Annandale*] ; Sylhet, May, June [*Hall*] ; Celebes, Mysol, North Ceram and Waigion [*t. Walker*] ; Settleberg (Huon golf) (Papua) [*Biro*] ; Ceylon [*Hope Coll. Oxford*] : also recorded from Trincomalee Hot Wells, Macassar and Travancore.

2. T. inornatus Wlk., 1865.

Pr. Linn. So. Lond., viii, 102 ♂ (*Megarhinus*).

Theob. Mon. Culic., i, 223 ♂ ♀ ; pl. vii, 26 ♂ 25 ♀ (both full insects coloured, as *Megarhinus* id.).
Megarhinus inornatus Giles, Handbk., 2nd Ed., 271 ♂ ♀

Theobald's description is from two specimens in the British Museum of which I presume one is Walker's type (♂).

3. T. leicesteri Theob., 1804.

Entom., xxxvii, 36 ♂ ♀

Types in British Museum. Taken by Dr. Durham at Kuala Lumpur.

4. T metallica Leicester in Theob., 1904.

Entom., xxxvii, 37 ♂ ♀

Types in British Museum. Taken by Dr. Leicester at Kuala Lumpur.

WORCESTERIA Banks, 1906.

Phil. Jour. Sci., i, 779.

Near both *Megarhinus* and *Toxorhynchites*, but quite distinct.

1. W. grata Banks, 1906.

Phil. Jour. Sci., i, 780 ♂ ♀; plate, palpus ♂, genitalia ♂, cross veins ♂ ♀, scales, etc.

The adult does not bite. The species was bred during June.

Types (♂ ♀ No. 6071) in the Entomological Collection, Bureau of Science, Manila.

LOCALITIES: Bago, (150 metres alt.; June and July) (Negros Occidental Philippine Islands) [*Banks*]; and Cebu [*McGregor*], both places in the Philippines.

Sub-Fam. CULICINÆ.

Theob. Gen. Ins., Fasc. 26, p. 14. Chars. of sub-family, also analytical table of 30 genera.
Theob. Mon. Culic., i, 97, table of genera.
Giles Handbk., 2nd Ed., 334, table of genera.

MUCIDUS Theob., 1901.

Mon. Culic., i, 268.

Theob., Gen. Ins., Fasc. 26, p. 17.

A table of species given by Theobald. Monog., i, 269.

1. M. alternans Westw., 1881.

Tr. Ent. So. Lond., iii, 384.

Mucidus alternans Giles Handbk., 2nd Ed., 347 ♂ ♀; pl. xii, 2, wing ♀
Culex commovens Wlk. Ins. Saunds. Dipt. 432.
C. hispidosus Skuse. Tr. Linn. So. N. S. Wales, p. 1726.

The only oriental locality seems to be Papua [*Hungarian Museum*].

2. M. laniger Wied., 1821.

Dipt. Exot. 9 (*Culex id.*) ♀

Auss. Zweifl., i, 5 ♀
Culex laniger Macq. Dip. Ex., i, pt. 2, 176.

Type in Westermann's Collection. Recorded from Java and Coromandel.

3. **M. mucidus** Karsch, 1887.

Ent. Nachr. (1887) 25 (*Culex id.*).

Mucidus mucidus Theob. Mon. Culic., i, 272 ♀ ; pl. xi, 42 ♀ full ins. col. ; pl. B, wing scales.
Id. *id.* Giles, Handbk., 2nd Ed., 349 ♀ ; pl. xii, 3 wing ♀

4. **M. scatophagoides** Theob., 1901.

Mon. Culic, i, 277 ♀ ; pl. E, wing scales ; fig. 81 (p. 278) wing, thorax, scales.

Giles, Handbook, 2nd Ed., 348 ♀ ; pl. xii, 1,*a*, full ins., 2,*a*, venation.

An attempt by Major Close to breed the species from eggs laid by a ♀ in captivity, failed. He records that for a week in September in the Police Hospital at Moradabad (N.-W Prov.), it bit viciously. It is also recorded from Myingan in Burma.

DESVOIDYA Blanchard, 1901.

Comp. rend. So. Biol. Paris, No. 37, liii (*Desvoidea*). nom. nov. for *Armigeres* Theob., preoc.

Armigeres Theob. 1901 Mon. Culic., i, 322.
Desvoidea id. loc. cit., iii, 134.
Desvoidya emendation by Theob. in Gen. Ins. Fasc. 26, p. 17.

1. **D. fusca** Theob., 1903.

Mon. Culic, iii, 135 ♂ ♀ Fig. 75 mid-ungues ♂, palpus ♂ ; fig. 76, pupa figures.

Theob. Mon. Culic., iii, pl. xvii, larva figs.

Dr. Durham found the larva in a tub, and Miss Ludlow records it as being bred in the Philippines, " from larvæ taken from the water-filled joints of bamboo poles in the fence."

LOCALITIES : Kuala Lumpur [*Dr. Durham*] ; Angeles (Pampanga, Phil. Is.) [*Whitmore*].

2. **D. joloensis** Ludlow, 1904.

Can. Ent., xxxvi, 236.

Described by Miss Ludlow as a variety of *fusca*, mentioning that the variation was constant throughout the 23 ♂ ♂ ♀ ♀ examined, and as Banks admits it as a good species, I follow him. Taken by an unrecorded collector at Jolo (Jolo Island, Philippines).

3. D. obturbans Wlk., 1860.

Pr. Linn. So. Lond. iv, 91 ♀ (*Culex*).

Armigeres obturbans Theob. Mon. Culic., i, 323 ♂ ♀ Fig. 104, wing; fig. 105, palpus ♂ (incorrect), ungues ♀, ♂ genitalia; fig. 106 ♂ ungues.

Desvoidea obturbans Theob. Mon. Culic., iii, 138, fig. 75, 1 mid ungues ♂; fig. 77, corrected ♂ palpus; fig. 78, ♂ clasper.

Armigeres ventralis Wlk., Theob. Mon. Culic.; pl. xv; 57 ♀ full ins. col.

Id. *id.* Giles, Handbk., 2nd Ed., 385 ♂ ♀; pl. xiv, 11 venation, 12 claws.

Culex ventralis Wlk. 1861. Pr. Linn. So. Lond., v, 144.

The type (♀) is in the British Museum. A common species from the East Coast of India, through the Straits, and up the Chinese Coast. Capt. James has observed the whitish woolly larva breeding in pots and tubs of dirty water in the open and under trees. The adult is common in woods, rarely visiting houses. Miss Ludlow records it as having been bred in the Philippines, from larvæ from deep pools in a clear running stream.

Originally described from Amboina.

4. D. panalectoros Giles, 1901.

Jour. Bomb. So. xiii, 608,

and (1901) in Theob. Mon. Culic., ii, 317 ♂ ♀ (*Armigeres*).

Desvoidea panalectoros Theob. Mon. Culic, iii, 136; fig. 75, 3, palpus ♂ Loc. cit. iii; pl. xvii, larva figs.

Desvoidya *id.* Theob. Gen. Ins. Fasc. 26, p. 18.

Armigeres *id.* Giles, Handbk., 2nd Ed., 386 ♂; pl. xiv, 13 venation, 14 head ♂, 15 claws, 16 thorax.

The types are in the Indian Museum, and were captured by Col. Alcock of that Institution, at Calcutta, during the rainy season.

LOCALITIES: Calcutta [*Alcock*]; Perak [*Wright*]; Pampanga (Phil. Is.) [*Whitmore*].

STEGOMYIA Theob., 1901.

Mon. Culic, i, 283.

Theob. loc. cit. tab. spp., p. 285; map of distribution, p. 284.

Theob. Gen. Ins. Fasc. 26, p. 18.

Giles, Handbk., 2nd Ed., 368; table spp. 369.

1. S. amesii Ludlow 1903.

Jour. New Yk. Ent. So., xi, 139 (*Stegomyia nivea amesii*).

Described from the Philippines, but I can find no definite data except that Banks includes it in his Catalogue.

NOTE.—Banks mentions in addition to this species a "*Scutomyia nivea* Ludl. (*Stegomyia nivea*)" with exactly the same reference as this species, and adds: "There appears to be a confusion of this species with *Stegomyia amesii* Ludl. in the Genera Insectorum." I have not seen the New York journal, but I infer that Miss Ludlow described two species on the same page, *viz.*, (1) *Stegomyia nivea* Ludl., which Banks places as a good species in *Scutomyia*; and, (2) *Stegomyia nivea amesii* Ludl. (probably intended, to judge by the triplet of names, to be a sub-species), which Banks also ranks as a good species under the title *amesii* only, in *Stegomyia*.

2. S. annulirostris Theob., 1905.

Jour. Bomb. So., xvi., 239 ♀

Described from a unique ♀ from Peradeniya, Ceylon, taken in January.

3. S. aurostriata Banks, 1906.

Phil. Jour. Sci., i, 995, ♀

Type No. 6082 in the Entomological Collection, Bureau of Science, Manila, taken in June on the Canlaon Volcano, Negros Island (Philippines) at an altitude of 760 metres.

4. S. brevipalpis Giles, 1902.

Handbk., 2nd Ed., 384 ♂ ♀; pl. xiv, 17, 18, 19, wings, 20 head ♂

Theob. Mon. Culic., iii, 146 (*Culex id.*) ♂ ♀

Types in British Museum. Theobald said (Monog. iii, 146) that he had examined the types in the British Museum, and had found them to be not a *Stegomyia* but a typical *Culex*; but (in the Gen. Ins.) he replaces the species in the present genus. The ♀ bites during the daytime in houses.

Recorded in October from Shahjahanpur (N.-W Prov.).

5. S. crassipes Wulp, 1892.

Dip. Sum. Exp. 9, pl. i, 4, head (*Culex*).

Stegomyia crassipes Theob. Mon. Culic. i, 320 ♀; pl. xxxiv, 134 ♀ full ins. col.

Id. *id.* Giles, Jour. Trop. Med., vii, 367.

Id. *id.* Giles, Handbk., 2nd Ed., 381.

Described from 2 ♀ ♀ from Sumatra.

LOCALITIES: Soeroelangoen (Sumatra) (t. *Wulp*); Thayetmyo in August (Upper Burma) [*Watson*]; Pampanga (Phil. Is.) [*Whitmore*].

6. S. fasciata F., 1805.

Sys. Antl. 36 (*Culex*).

Stegomyia fasciata Theob. Mon. Culic., i, 289 ♂ ♀; figs. 86 to 89, var. chars; map of distribution, p. 292; pl. xiii, 49 ♂, 50 ♀, both full ins. col. Pl. B, wing scales; also of a Queensland var.

Id. *id.* Theob. Gen. Ins. Fasc. 26; pl. i, fig. 11, ♀ full ins. col.

N.B.—In this plate are given two full insects, and figures of a thorax and a leg. The full insects figures apply to *fasciata* F., typical form ♂ ♀, the figure of the thorax to the variety *mosquito* Rob. Desv., and the figure of the leg to Theobald's variety *luciensis*.

Stegomyia fasciata Giles, Handbk., 2nd Ed., 372; pl. xiv, 2, venation; 3 thorax.

Synonyms (*Culex*)—

calopus Meig. 1818, Sys. Bes., i, 3.
Desv. 1827, Ess. Culic., 407.
tæniatus Wied. 1828, Auss. Zweifl., i, 10 ♂ ♀
Konoupi Brullé 1832, Exped. Morea. Ann. So. Nat. Paris, xxiii.
formosus Wlk. 1848, List Dip. Br. Mus. i, 4 ♀
viridifrons Wlk. 1848, l.c., p. 3, ♀
inexorabilis Wlk. 1848, l.c., p. 4, ♀
excitans Wlk. 1848, l.c., p. 4, ♀
exagitans Wlk. 1856, l.c., p. 430, ♀
impatabilis Wlk. 1860, Pr. Linn. So. Lond., iv, 91 ♂
zonatipes Wlk. 1860, l.c., v, 229 ♂
annulitarsis Macq. 1838, Dip. Ex. Supp., i, 136 ♀.
toxorhynchus Macq. l.c., i, 25.
bancroftii Skuse 1886, Pr. Linn. So., N. S. Wales, iii, p. 1740.
mosquito Arrib. 1891, Dipt. Argent, 60.
elegans Ficalbi 1896, Bull. So. Ent. Ital. (1896), p. 251.
rossii Giles 1899, Jour. Trop. Med., p. 64.
var. *mosquito* Rob. Desv. 1827, Ess. Culic., 407. Theob. Mon. Culic. i, 295; pl. xiii, 50 (the separate figure of thorax only).
luciensis Theob. Mon. Culic. i, 297 ♂ ♀; pl. xiii, 50 (the separate figure of a leg only).
queenslandensis Theob., l.c., i, 297 ♀

Theobald in his report on the Buda Pesth Museum *Culicidæ* (Ann. Mus. Hung., iii, 73) mentions a var. *mosquito* Arribalzaga as occurring at Port Said and Singapore (collected at both places by Biro, the specimens being in the Hungarian National Museum

collection), but in the " Genera Insectorum " he sinks Arribalzaga's "*mosquito*" as an absolute synonym of *fasciata* F., typical form, and gives *mosquito* R. Desv. as a good variety.

This is one of the most variable species in the family.

Banks says " all parts of the tropical world," but this may be doubted, as I can obtain only Biro's record from Oriental latitudes—except those of Banks.

Australian ♀ ♀ are said to be larger than Asiatic, East Indian or West Indian ones, but Australian ♂ ♂ are of no larger size than usual. The eggs are laid separately and not in rafts. Dr. Low says they begin to breed the first day they emerge from the pupa, one ♂ fertilising many ♀ ♀, and pairing by night freely as well as by day. The eggs possess great vitality and do not lose it, even if completely dried for some weeks. He calls it an " essentially domestic mosquito " breeding in any receptacle holding water near the house, and in company with *C. fatigans* Wied.

In the West Indies it bites viciously between 1 and 3 p.m.

LOCALITIES: Singapore and Friedrich Wilhelmshafen (Papua) [both *Biro*]: Pampanga (Phil. Is.) [*Whitmore*]. Also occurs at Port Said and Muscat (Arabia).

Sub-species **persistans** Banks, 1906.

Phil. Jour. Sci., i, 996.

The type ♂ and ♀ of this variety are in the Entomological Collection (Type No. 5773), Bureau of Science, Manila.

He says it is the "most abundant day flying mosquito in this region and a vicious biter, appearing generally, and biting fiercely, just before a storm."

LOCALITIES: Manila, Iloilo and Bago (Negros Is.); (all Phil. Is.) [*Banks*]; Fort McKinley (Phil. Is.) [*Craig*]; and taken by various collectors elsewhere in these Islands.

7. S. gardneri Ludlow, 1905.

Can. Ent., xxxvii, 99 ♂ ♀.

LOCALITIES: Bulaco in August (Mindoro Is. Philippines) [*Gardner*]; Pampanga (Luzon) [*Whitmore*].

8. S. mediopunctata Theob., 1905.

Jour. Bomb. So., xvi, 240 ♀

Described from a unique ♀ in perfect condition taken in November at Peradeniya (Ceylon).

9. S. microptera Giles in Theob., 1901.

Mon. Culic., ii, 281 ♂ ♀ (*Wyeomyia* (?) *micropterus*).

Stegomyia microptera Giles, Handbk., 2nd Ed., 380 ♂ ♀ ; pl. xiv, 24, head, thorax ; 25, head ; 26, venation.

Id. id. Theob. Mon. Culic., iii, 147 (note).

Culex micropterus Giles Jour. Bomb. So., xiii, 609.

Theobald (Monog., ii, 281 ♂ ♀, fig. 291, wing) publishes Giles's description with " Allahabad and Lucknow, in houses," as data.

Giles suggested that the species belonged to Theobald's *Wyeomyia*, but the latter replied, " Some mistake has been made here ; the insect referred to is undoubtedly a typical Culex." In vol. iii (Monog.), p. 147, he writes that " it is now said by Giles to be a *Stegomyia*, *vide* his Handbk., 2nd Ed., 380." Theobald continues (l.c.), " I have not seen the specimen, which appears to have been lost. Another locality is given, *viz.*, Jhansi." Probably the fact of what is apparently the type being lost, accounts for Theobald not including the species in the " Genera Insectorum." Moreover he speaks of " the specimen," but from Giles's original description (in Theob. Monog., i, 281), the author appeared to have several examples.

LOCALITIES : Allahabad, Jhansi, Lucknow [*Giles*].

10. S. periskelata Giles, 1902.

Handbk., 2nd Ed., 371 ♂; pl. xiv, 22, head ♂

Theobald in Mon. Culic., iii, 145, describes the ♂, but it does not appear in his revision in the " Genera Insectorum."

Recorded from Shahjahanpur (October) in the N.-W Provinces.

11. S. pipersalata Giles in Theob., 1901.

Mon. Culic., ii, 316.

Giles, Handbk., 2nd Ed., 372 ♂; pl. xvi, 1*a*,*b*, venation ♂

Type in British Museum. The species is ignored by Theobald in the " Genera Insectorum."

LOCALITIES : Jhansi and Gonda (N.-W. Provinces).

12. S. pseudonivea Theob., 1905.

Ann. Mus. Hung., iii, 75 ♀

Described from a unique ♀ taken by Biro in January at Singapore and now in the Hungarian Museum Collection.

13. S. punctolateralis Theob., 1903.

Entom., xxxvi, 156, ♂ ♀

Giles, Jour. Trop. Med., vii, 367.

LOCALITIES: Pampanga (Philippines) [*Whitemore*]; Queensland in January [*Dr. Bancroft*].

14. S. scutellaris Wlk., 1859.

Pr. Linn. So. Lond., iii, 77, ♂ (*Culex id.*).
Theob. Mon. Culic., i, 298 ♂ ♀, fig. 91 ♂ ungues; pl. xiv, 53, ♀, full ins. col.

Stegomyia id. Giles, Handbk., 2nd Ed., 374 ♀; pl. xiv, 4, venation, 5 head, thorax ♂
Culex variegatus Doles. Nat. Tijd. Ned. Ind., xvii, 77.

The larva of this species has been continually observed.

Theobald mentions it as breeding in standing water near houses at 500 feet altitude; Aitken reared it in Bombay, the larvæ living amongst rotten leaves; and he found it abundant in the Canara District, living in forest streams.

One of the most widely distributed species. Mr. Aitken says it bites during the day in the Canara District, whilst Mr. B. G. Corney declares it disappears at night at Fiji (Bera Is.).

Type in British Museum, in good condition.

Mr. Theobald has omitted this species from the "Genera Insectorum." Presumably this is an oversight, as he does not account for the species in any way.

LOCALITIES: Madras and Naini Tal [*Giles* and *Cornwall*]; Canara District [*Aitken*]; Sombalpur (Cent. Prov.) [*Dr. O'C. Murphy*]; Ceylon November and 12-xi-1899 [*Bartholomew*]; Selangor 28-x-1899 "very common" [*Butler*]; Upper Burma (March) [*Watson*]; Siam (abundant) [*Skeat*]; Penang [*Freer*]. Perak [*Wright*]; Singapore, 4-ix-1899 [*Raffles Museum*], also "27-vi-1899," and from "Singapore" [*Biro*]; Celebes and Aru [*t. Walk.*]; Ins. Deslacs and Ins. Graget [*Biro*]; Selve, Berlinhafen, Stephansort and Muina (all Papua) [*Biro*]; Amboina [*t. Doles.*]; Hongkong 27-ix-1899 [*Ford*]; Foochow 9-viii-1900 [*Rennie*]; Shaohyling (China) (*Cornford*); Tamsvi (*Formosa*) 2-viii-1899 [*Mackay*]; Japan [*Wood*]; Bayambang (Pangasinan, Phil Is. [*Chamberlain*]; North Borneo. Outside the Orient it occurs in Mauritius, 22-xi-1899 [*Sir Ch. Bruce*]; Fiji 30-xii-1899 [*Black*]; Victoria (Seychelles) [*Dr. Denman*]; and on Christmas Island [*Dr. Durham*].

Sub-species samarensis Ludlow, 1903.

Jour. New Yk. Ent. So., xi, 138.

also in Can. Ent., xxxvi (1904), 71 for difference between typical form (*scutellaris* Wlk.) and this var.

Banks says that *scutellaris* Wlk. (typical) has not been seen by him from the Philippines, but that this variety is widespread there, and that he has bred several varieties of it, all reared from the same lot of eggs. He suggests " intergradation between (*scutellaris* and *samarensis*."

Although Theobald places this sub-species under *Scutomyia notoscripta*, Skuse, I retain it under *scutellaris* Wlk., following the more recent authority of Banks (Phil. Jour. Sci., i, 985) who raises it to the dignity of a species.

LOCALITIES: Samar, Leyte, Mindoro, Iloilo, Negros (all Phil. Is.) [*t. Banks*]; Manila, Fort McKinley [*Craig*].

NOTE.—**albopictus** Skuse, Ind. Mus. Notes, iii, 20.

I find some difficulty in deciding where to place the above form.

Theobald in his Monograph (i, 298) sinks it as a synonym of *Stegomyia scutellaris* Wlk., as does Giles (Handbk., 2nd Ed., 374). Yet in the Genera Insectorum, Theobald omits *scutellaris* Wlk. altogether (this must surely be an omission by error), and gives *albopictus* Skuse as a synonym of *Scutomyia notoscripta* Skuse. Moreover, his reference to Skuse's description in " Ind. Mus. Notes " should be vol. iii, pt. 5, and not " vol. 35."

Whether a good species or whether synonymous with *scutellaris* or *notoscripta*, the form *albopictus* is common throughout the summer in Calcutta, I myself having bred it during August from larvæ found in the bathroom. They metamorphosed quite readily in an empty biscuit tin, and I believe developed a second generation therein, but I could not be quite certain that this latter was not due to other specimens obtaining access to the water.

Dr. Annandale took it at Bhim Tal (Kumaon 4,500 ft.) in Sept. 1906, where it was freely breeding in water butts near European houses, also in cavities holding water in jungle trees. From a comparison of the descriptions, and an examination of specimens it seems to be a form of *scutellaris* Wlk., under which specific name I therefore retain it.

15. S. sexlineata Theob., 1901.

Mon. Culic., i, 308 ♀, fig. 94, head, thorax, abdomen, ungues, wing scales, etc.

Giles Handbk., 2nd Ed., 377.
Id. Jour. Trop. Med., vii, 367.

Described by Theobald from a unique perfect ♀, taken at Agua Santa (Trinidad) in December. Giles is uncertain of the identity of his species with Theobald's.

Taken by Whitmore at Angeles (Pampanga, Phil. Is.).

16. S. thomsoni Theob., 1905.

Gen. Ins. Fasc. 26, p. 18.

Theobald does not mention the sex of this species, which comes from the North-West Provinces of India. The " description " is confined to five lines.

17. S. w-alba Theob., 1905.

Ann. Mus. Hung., iii, 74 ♀, fig. 4, thorax, head, femur.

Type in Hungarian Museum. Described from a perfect unique ♀, which was taken by Biro at Matheran (India, near Bombay) at an altitude of 800 metres.

NOTE.—The following species, described as *Stegomyia* are not accounted for by Theobald in his " Gen. Ins. " revision.

18. S. desmotes Giles, 1904.

19. S. leucomeres Giles, 1904.

20. S. striocrura Giles, 1904.

All three species are described in the " Jour. Trop. Med." VII, 367, and all three were taken by Whitmore at Angeles (Pampanga, Phil. Is.).

SKUSEA Theob., 1903.

Mon. Culic., iii., 291 ;
also in Gen. Ins. Fasc. 26, p. 19.

1. S. culiciformis Theob., 1905.

Ann. Mus. Hung. iii, 77 ♀ ; pl. i, wing ; pl. iv, wing scales.

Described from a unique ♂ which is in the Hungarian Museum, and was collected by Loria on the Paumomu River in Papua.

2. S. diurna Theob., 1903.

Entom., xxxvi, 259 ♀

Described from a single perfect ♀ taken by Dr. Durham in September at the hospital reservoir at Jugra (Kuala Lumpur). It is a day flyer and near *S. multiplex.*

3. S. funerea Theob., 1903.

Mon. Culic., iii, 292 ♀, fig. 164 (p. 292), head, abdomen.

Types in British Museum.

Var. **ornata** Theob., 1905.

Ann. Mus. Hung., iii, 79, ♀ ; pl. i, wing.

Described from 8 ♀ ♀ Captured by Biro at Sattelberg (Huon Golf) and Friedrich Wilhelmshafen, both places in Papua.

4. **S. multiplex** Theob., 1903.

Mon. Culic., iii, 293 ♀, fig. 165, head ungues.

Original description from 3 ♀ ♀ from Australia, but Theobald found it in the Hungarian Museum from four Papuan localities (the specimens collected by Biro), *viz.*, Friedrich Wilhelmshafen, Stephansort, Muina and Ins. Graget.

SCUTOMYIA Theob., 1904.

Entom., xxxvii, 77.

Has affinities with *Stegomyia*, *Macleaya* and *Leicesteria*.

1. **S. albolineata** Giles, 1901.

Jour. Bomb. So., xiii, 609.

India. I can find no further data.

2. **S. albolineata** Theob., 1904.

Entom., xxxvii, 77 ♀

Apparently a case of a second species of the same name, as Theobald does not account for Giles' species in any way in the Genera Insectorum.

Described from a unique ♀ taken by Dr. Leicester during June in jungle, six miles from Kuala Lumpur.

Type in British Museum. "Close to *scutellaris* Wlk."

3. **S. nivea** Ludlow, 1903.

Jour. New Yk. Ent. So., xi, 139 (*Stegomyia id.*).

Federated Malay States and Philippine Islands.

N.B.—*Vide* Note under *Stegomyia amesii*.

4. **S. notoscripta** Skuse, 1889.

Pr. Linn. So., N. S. Wales, iii, p. 1738 (*Culex*).

Sub-species **samarensis** Ludl., 1903.

Jour. N. Yk. Ent. So., xi, 138.

Philippine Islands.

Mr. Theobald in the "Gen. Ins." gives *albopictus* Skuse as a synonym of *notoscripta* Skuse. *Vide* my notes under *Stegomyia scutellaris* Wlk.

5. **S. fusgens** Wied., 1828.

Auss. Zweifl., i, 545 ♀ (*Culex*).

Theob. Mon. Culic., i, 300.
Patton Jour. Bomb. So., xvi, 634; pl. D, head of larva, male clasper.
Giles, Handbk., 2nd Ed., 375 ♂ ♀

First described by Wiedemann from West and Central Africa, but it has been found quite recently by Patton in Arabia, breeding in tanks, barrels, wells or any still water, being a very common species at Aden, its bite being very irritating. The ♂ is said not to bite.

LEICESTERIA Theob., 1904.

Entom., xxxvii, 211.

Theob., Gen. Ins. Fasc. 26, p. 20.

Near *Eretmapodites*, *Macleaya*, *Scutomyia*, etc.

1. **L. longipalpis** Leicester in Theob., 1904.

Entom., xxxvii, 211 ♂ ♀

Types in British Museum. Taken at Kuala Lumpur by Dr. Leicester.

HULECOETOMYIA Theob., 1904.

Entom., xxxvii, 163.

Theob., Gen. Ins. Fasc. 26, p. 20.

These *Culicidæ* have the appearance of *Stegomyiæ*.

1. **H. pseudotaeniata** Giles, 1901.

Entom., xxxiv (*Stegomyia*).

Theob. Mon. Culic., i, 312 ♀, fig. 96, thorax, head ♀, wing scales.
Larva descr. loc. cit., i, 314; iii, fig. 16 (p. 28), larva.
Stegomyia id. Giles, Handbk., 2nd Ed., 379 ♂ ♀; pl. xiv, 8, venation; 9, body; 10, larva.

Apparently a hill species. Theobald says it occurs in May; Banks found it common in January at the Manila Waterworks at Rizal, and he bred the species under similar conditions to those of Giles, who took it in the hills.

Localities: Bakloh (Punjab) and Lower Himalayas 6,000 to 8,000 feet, Naini Tal [*Giles*]; Manila [*Banks*].

2. **H. trilineata** Leicester in Theob., 1904.

Entom., xxxvii, 163 ♂ ♀

Types in British Museum.

LOCALITY: Kuala Lumpur in April [*Leicester*].

PHAGOMYIA Theob., 1905.

Gen. Ins. Fasc. 26, p. 21.

1. **P. gubernatoris** Giles, 1901.

Entom., xxxiv, 194 ♀ (*Stegomyia*), and Jour. Bomb. So., xiii, 607.

Theob. Mon. Culic., i, 314 ♀, fig. 97 (p. 315), thorax ♀

Giles, Handbk., 2nd Ed., 380 ♀

Recorded from Allahabad (July) and "North India." The single specimen forming the type was accidentally damaged, after being described [*Giles*].

HOWARDINA Theob, 1903.

Mon. Culic., iii, 287; pl. xv, wing scales.

Theob., Gen. Ins. Fasc. 26, p. 21.

1. **H. greenii** Theob., 1903.

Mon. Culic., iii, 289 ♀, fig. 160 (p. 289), head, fig. 161, wing.

Described from a unique.

LOCALITY: Peradeniya (Ceylon) in Feb.

2. **H. himalayana** Giles, 1904.

Jour. Trop. Med., vii, 384.

Recorded from Naini Tal.

DANIELSIA Theob., 1904.

Entom. xxxvii, 78.

Theob. Gen. Ins. Fasc. 26, p. 21.

Near *Scutomyia*, *Macleaya* and *Catageiomyia*.

1. **D. albotaeniata** Leicester in Theob, 1904.

Entom., xxxvii, 111 ♂ ♀

Bred in April by Dr. Leicester from larvæ taken in bamboo jungle six miles from Kuala Lumpur. Resembles *Stegomyia nivea*. Types in British Museum.

LEPIDOTOMYIA Theob., 1905.

Ann. Mus. Hung., iii, 80, and Gen. Ins. Fasc. 26, p. 22.
" Intermediate between *Culex* and *Stegomyia*."

1. L. alboscutellata Theob., 1905.

Ann. Mus. Hung., iii, 80 ♀

Described from two ♀ ♀ Types in the Hungarian National Museum at Buda Pesth.

LOCALITIES: Simbang (Huon Golf) and Friedrich Wilhelmshafen; both in Papua and collected by Biro.

2. L. magna Theob., 1905.

Gen. Ins. Fasc. 26, p. 22.

Recorded from Bombay.

THEOBALDIA Nev. Lemaire, 1902.

Comp. rend. Soc. biol. Paris (1902).

Theob. Mon. Culic., iii, 148; pl. x, wing scales, var. spp.
Theob. Gen. Ins. Fasc. 26, p. 23.

1. T. annulata Schrk., 1776.

Beitr. z. Naturg. 97 (*Culex*).

Culex annulatus Fab. Ent. Sys., iv, 400 (Culex).
Id. *id.* Meig. Sys. Besch., i, 3.
Id. *id.* Macq. Hist. Dipt., i, 35.
Id. *id.* Sch. F. Austr., ii, 626.
Id. *id.* Zett. Dip. Scand., ix, 3640.
Id. *id.* V Wulp. Dip. Neer, 325.
Id. *id.* Theob. Mon. Culic., i, 331 ♂ ♀, fig. 108, abd. segments, ungues ♂ ♀, palpus ♂; pl. xv, 58, full ins. col.
Id. *id.* Giles Handbk., 2nd Ed., 391; pl. xv, abd. seg.; claws ♂ ♀, wing ♀; head ♂; genitalia ♂
Theobaldia *id.* Theob. Gen. Ins. Fasc. 26; pl. i, 12 ♀ full ins. col.
Culex affinis Stephens 1825, Zool. Jour. No. 1 (type in Hope Coll., Oxford).
C. variegatus Schrk. 1781, Enum. Ins. Austr. 482.

Ficalbi says it does not bite man or animals, but feeds on plant juices. This author and Giles have considered *Culex penetrans* Rob. Desv. a variety of *annulata*, but Theobald (Monog. i, 334) thinks

it distinct, adding that both sexes hybernate, and that he has taken it (presumably in the adult stage) at all seasons of the year, but gives no data.

LOCALITIES: Punjab (November), Bakloh (Punjab), 5,000 ft. [*Lindesay*]. The species is common in Europe from April to October, and it also occurs in North America.

2. T. spathipalpis Rond., 1886.

Prod. Dipt. Ital., i, ♀ (*Culex*).

Theob. Mon. Culic, i, 339 ♂ ♀ ; iii, 154 ♀; pl. x, wing scales.

Giles Handbk., 2nd Ed., 392 ♂ ♀; pl. xv, 23, wing ♀, 24, head ♂; 25, genitalia ♂

Ficalbi Venti. spec. Zan. Ital., p. 146, in Bull. Soc. Ent. Ital.

A south European species, occurring from Italy through Cyprus and Palestine to North India, being recorded from Gibraltar in September and from India in June and July. Ficalbi describes the ♂

Giles thinks this species may be identical with *longiareolatus* Macq., in which case the latter name takes precedence.

Theobald mentions receiving a ♂ from India, but gives no locality. Dr. Grabham, writing from Madeira, says it is not found in houses, but that he has bred them from larvæ found in great abundance in stagnant water, especially horse ponds.

Giles records finding the species in a bathroom at Naini Tal (7,000 ft.), this being the only definite oriental locality I can find. Outside this region it occurs at Cyprus (5,000 ft.), S. Africa (1,300 ft.), Algeria, Teneriffe, Madeira, etc.

PECOMYIA Theob., 1905.

Jour. econ. biol., i.

1 P. maculata Theob., 1905.

Jour. econ. biol., i ; pl. iv, 7.

Described from India.

PSEUDOGRABHAMIA Theob., 1905

Jour. Bomb. So., xvi, 243.

1. P. maculata Theob., 1905.

Jour. Bomb. So., xvi, 243 ♂ ♀

Described from 1 ♂ and 2 ♀ ♀, perfect specimens from Galgamuwa, Ceylon (August).

GRABHAMIA Theob., 1903.

Mon. Culic., iii, 243 ; pl. xi, wing scales.

Theob. Gen. Ins. Fasc. 26, p. 23.

1. G. ambiguus Theob., 1903.

Mon. Culic., iii, 248 ♂

A unique, taken by Capt. James in July at Quilon (Travancore, S. India).

2. G. deniedmanni Ludlow, 1904.

Can. Ent., xxxvi, 234.

Philippines.

3. G. ochracea Theob., 1905.

Jour. econ. biol., i, 25.

India.

? 4. G. sollicitans Wlk., 1856.

Ins. Saunds. Dipt., 427.

Theob. Mon. Culic., i, 368 ♀ ; pl. xvi, 64 ♀ ; full ins. col.
Id. id. iii, fig. 130 (p. 248), wing ♀

This species may possibly not be oriental, being mainly a North American one. I include it on the ground that an example from Formosa received by Theobald appears to him to be probably *sollicitans*.

The larva breeds in brackish water and is common on the Atlantic seaboard of America.

5. G. spenceri Theob., 1901.

Mon. Culic., ii, 99 ♀ ; pl. xxvi, 104, full ins. col. (*Culex*).
Theob. loc. cit. ii, fig. 198 (p. 100) wing abdominal segment, base of antennæ.
Grabhamia spenceri Theob. loc. cit. iii, 250.
Culex id. Giles Handbk., 2nd Ed., 431.

Theobald quotes this as from the Philippines, although it is a North American species, but Banks doubts its occurrence in those Islands. (*Vide* Phil. Jour. Sci. i, 986.)

Theobald describes a var. *idahoensis* from Idaho in Monog. ii, 250.

LOPHOCERATOMYIA Theob., 1905.

Jour. Bomb. So., xvi, 245, and Ann. Mus. Hung., iii, 93.

1. **L. brevipalpus** Theob., 1905.

Ann. Mus. Hung., iii, 96 ♂, fig. 9 (p. 96),
palpus ♂, proboscis base of antennæ, ungues.

A unique specimen, in the Hungarian Museum taken by Biro at Singapore.

2. **L. fraudatrix** Theob., 1905.

Ann. Mus. Hung. iii, 94 ♂ ♀, fig. 7 (p. 94),
palpus ♂ ♀, fig. 8, antennal organs.

Types in Hungarian Museum. Described from a good series of both sexes.

LOCALITIES: Friedrich Wilhelmshafen and Stephansort (both Papua).

3. **L. uniformis** Theob., 1905.

Ann. Mus. Hung., iii, 93 ♂ ♀
Pl. A, 3, antenna; pl. B, 4, palpus.

Described from 2 ♂ ♂ and several ♀ ♀
Recorded from Peradeniya (Ceylon) during May.

CULEX Linn., 1758.

Linn. Sys. Naturæ, Ed. x, 602.
Meig. 1818, Sys. Besch., i, 1.
Macq. 1834, Hist. Nat., i, 33.
Sch. 1864, Fn. Aust., ii, 625.
V. Wulp 1877, Dip. Neer, 323.
Theob. 1901, Mon. Culic., i, 326.
Culex, restricted by Theobald, Gen. Ins. Fasc. 26, p. 24.

1. **C. albolineatus** Giles, 1902.

Handbk., Gnats, 2nd Ed., 430 ♀; pl. xvii, 10 a, venation ♀
Theob. Mon. Culic., iii, 192 ♀

Described from a single ♀ taken in a bungalow.

LOCALITY: Shahjahanpur (N.-W Prov.), Oct. 20th.

2. **C. angulata** Theob., 1901.

Mon. Culic., ii, 324 ♀

Very near *fatigans* Wied. Described from 2 ♀ ♀ in Col. Giles's coll., taken by him in June at Naini Tal (4,000 ft.).

3. C. annuliferus Ludlow, 1903.

Jour. New Yk. Ent. So., xi, 141 (*annulifera*).

Theobald's reference to vol. 2 instead of xi is an error. (Gen. Ins.)

LOCALITY: Bayembang (Pangasinan Phil. Is.) [*Chamberlain*].

4. C. annulus Theob., 1901.

Mon. Culic., i, 358 ♀
Giles Handbk., 2nd Ed., 405 ♀

Described from several ♀ ♀ in Dr. Rees's collection.

LOCALITIES: Tai Po (Pokfulam), Hongkong, Straits (Dindings, Oct. to Dec.), Lamma.

5. C. biroi Theob., 1905.

Ann. Mus. Hung., iii, 82 ♂ ♀ ; pl. i, wing ♂ ♀.

Closely allied to *C. vishnui* Theob. Types in Hungarian Museum.

LOCALITY: Bombay [*Biro*].

6. C. caecus Theob., 1901.

Mon. Culic., i, 413 ♀, fig. 147, head; fig. 148, scutellum and scales; pl. xx, 77, full ins. col.

Giles, Handbk., 2nd Ed., 415 ♀

LOCALITIES: Selangor 28-x-1899 [*Butler*]; Klang Mangrove Swamps.

7. C. cantans Meig., 1818.

Sys. Besch. i, 6.
C. stimulans Wlk. List. Brit. Mus. Dip. i, 4 ♀
C. fumipennis Steph. Zool. Jour. i, 453.

Culex maculatus Meig. is erroneously given as a synonym by Theobald in Proc. Roy. So. Lond., lxix, 388. Walker's species was described from Nova Scotia.

LOCALITY: Coonoor, 6,000 ft. (Nilgiri Hills), North India [*Dr. Price*].

8. C. concolor Rob. Desv. 1825.

Mem. So. His. Nat. Paris, iv, 405.

Theob. Mon. Culic., ii, 107 ♂ ♀, fig. 203 ♂, palpus.
Id. id. Pl. xxviii, 109 ♂, 110 ♀, both full ins. col.
Giles, Jour. Trop. Med., vii, 368.
Id. Handbk., 2nd Ed., 454 ♂ ♀ ; pl. xvii, 8 *a,b*, venation ♂ ♀

Generally distributed through India and the Straits, common during the rains. Theobald says that owing to the type having apparently been lost, a comparison is impossible, but the species identified by him with it is generally known as Desvoidy's *concolor*. The original description is too meagre for satisfactory determination, and Theobald and Banks both concur in considering it must be removed from the genus *Culex*.

Patton found it breeding in a tank in the Aden hinterland, and Capt. James and Aitken have also studied the larvæ (Theob. Monog., iii, 231) which voraciously fed on other *Culicidæ* larvæ and were, moreover, cannibalistic. They come from grassy pools and (occasionally) wells. A species named "*C. fuscanus*" amongst the old specimens at the British Museum is identified as *concolor* by Theobald.

LOCALITIES: Sylhet 1-ii-1905 and 1-xii-1904 [*Hall*]; Purneah (N. Bengal), 6-viii-1907 [*Paiva*]; Rajmahal (Bengal) 1-viii-1907 [Ind. Mus. Coll.]; Damukdia (E. Bengal) 22-vii-1907 [Ind. Mus. Coll.]; Calcutta, common July, Aug. [*Annandale*]; Gopkuda Is., Chilka Lake, Orissa (E. Coast, India), August 1907 [Ind. Mus. Coll.]; Canara District [*Aitken*]; Quilon [*James*]; N.-W. Provinces [*Giles*]; Madras, 25-xi-1900 [*Cornwall*]; Mozufferpur (Behar, Bengal) [*Green*]; Upper Burma (August) [*Watson*]; Selangor, 28-x-1899 [*Butler*]; Kuala Lumpur [*Durham*]; Perak, 22-xi-1899 and 21-xii-1899 [*Wray* and *Wright*]; Hongkong [*Rees*]; Pampanga (Phil. Is.), [*Whitmore*]; also Foo Chow in China.

9. C. fatigans Wied., 1828

Auss. Zweifl. i, 10 ♂ ♀

Theob. Mon. Culic., ii, 151 ♂ ♀, fig. 234 ♂, wing, fig. 235 ♂ genitalia, fig. 236, wings; p. 155, map of distribution; pl. xxix, 114 ♂, 115 ♀, both full ins. col.; pl. D, wing scales.

Id. id. ii, 156 *et seq.*, long list vars. and locs.; fig. 238, 10 variations of wings; as an intermediate host, p. 161.

Id. Gen. Ins. Fasc. 26; pl. ii, 2 ♀, full ins. col.

Giles Handbk., 2nd Ed., 438 ♂ ♀ fig. 45, wings, head, etc., p. 440, list of sub-species.

Culex æstuans Wied. Auss. Zweifl., i, 11.

? *C. pungens* Wied., l.c. i, 9.

C. pallipes Meig. Sys. Besch. Suppl. (1838).

C. anxifer Coquerel (Big.) Ann. So. Ent. Fr. (1858).

C. skusii Giles, Handbk., 1st Ed., 292.

Heteronycha dolosa Arrib. Dipt. Argent, p. 56.

? *Culex macleayi* Skuse Pr. Linn. So. N. S. Wales (1896), p. 1745.

Sub. sp. **luteoannulatus** Theob. Mon. Culic., ii, 159.
Id. **trilineatus** *id.* l.c., ii, 159.
id. Giles Handbk., 2nd Ed., 464 ♀ (Thayetmyo, Upper Burma).

The characters of these two subspecies are defined by Theobald but no special localities are given.

If *Culex pungens* of Wiedemann is identical with this species, that name takes precedence. Type presumably in Wiedemann's coll. A widely distributed, common species throughout the Orient, and occurs as far north as Italy. Patton reports it as very common in the Aden hinterland, breeding everywhere in springs, wells and puddles. Banks describes it as the most common night mosquito in the Philippines, hiding during the day in clothes. Dr. Low has seen them pairing by night.

LOCALITIES: Naini Tal [*Giles*]; Sambalpur [*Murphy*]; Etawah, (N.-W Prov.) [*Maj. Scotland*]; Mozufferpur (Behar, Bengal), [*Green*]; Calcutta 6-iii-1899 [*Daniels*; also by *Dr. Annandale*]; Madras 12-xii-1899 [*Goodrich*]; Madras [*Biro*]; Quilon [*James*]; Kurmregalla, Badulla, Balangoda and Keleni Valley (all four in Ceylon; Jan., March and November, taken by Green); Straits (Dindings) [*Wray*]; Perak [*Wright*]; Singapore, 4-ix-1899 and July [*Hanitsch* and *Biro*]; Papua (Friedrich Wilhelmshafen, and Stephansort) [*Biro*]; Hongkong, 8-i-1900 and July [*Ford*]; Foo Chow [*Rennie*]; Shaohyling (China) [*Cornford*]. Also occurs in very many places in North, Central and South America, many West India Islands, Africa, Fiji, etc., etc.

10. C. foochowensis Theob., 1901.

Mon. Culic., ii, 137 ♂ ♀
Fig. 224, wing ♀, cross veins, scutellum, ungues ♂, fig. 225, palpus and proboscis ♂, genitalia, abdomen, bristles and wing scales.

An August species from Foo Chow (China); [*Rennie*].

11. C. fragilis Ludlow, 1903.

Jour. New Yk. Ent. So., xi, 143 ♀.

Philippines.

12. C. fuscanus Wied., 1828.

Auss. Zweifl., i, 6.

Theob., Mon. Culic., ii, 167.
Id. Gen. Ins. Fasc. 26, p. 30 (quotation incorrect).
Giles, Handbk., 2nd Ed., 455 (no sex given).
The author gives no sex, nor any reference to the type.

Theobald's references to "*C. fuscanus* Wied." are not at all definite. Under his accepted species of *Culex* (*sensu strictu*), he gives "*fuscanus* Wied. 1821, Dip. Ex. p. 9," adding East India, Malacca, Singapore and Sarawak as localities (the latter three, probably on the authority of Walker). Then under his " species unidentifiable, except from types," he places " *C. fuscanus* Wied., 1838, Dip. Ex. 4th supp., p. 9." First of all, the two quotations, by their similarity, appear to refer to the same reference, but, apart from that, Wiedemann in his " Auss. Zweifl." (1828), in describing the species (i, p. 6) does not give any earlier reference, as is usual with him when dealing with species previously described by him elsewhere. This makes me doubt the reference to " Dip. Ex.," more especially as Van der Wulp's Catalogue quotes the " Auss. Zweifl." description as the original one. By the way, Theobald's 2nd quotation is not an error for Macquart's " Dipt. Exot.," as this latter author does not mention the species at all. I therefore include the species *fuscanus* as a good one under Wiedemann's " Auss. Zweifl." reference and under *Culex*. " No specimen has yet been received at the British Museum answering to the description of this species." (Theob.)
LOCALITIES: E. India, Singapore, Malacca, Sarawak.

13. C. gelidus Theob., 1901.

Mon. Culic., ii, 20 ♀; pl. xxiv, 93 ♀, full ins. col.; fig. 158, thorax and hind tarsus.

Giles, Handbk., 2nd Ed., 421 ♀
Theob. Mon. Culic., ii, 20 ♀ fig. 158, thorax and hind tarsus.

Described from a single perfect ♀ taken by Mr. Butler amongst plantains, Oct. 23rd, 1899, in Selangor.

The species is said to be near *C. confirmatus* Arrib.

What appears to be the ♂ of the typical form (hitherto undescribed) was captured at light by Dr. Annandale in Calcutta, 30-vii-1907, and is now in the Indian Museum collection. During July and August this year (1907) this gentleman has taken both sexes fairly commonly on mossy walls of gardens adjoining the Museum.

LOCALITIES: (Typical form) Purneah (N. Bengal), 6-viii-1907 [*Paiva*]; Peradeniya (July and Sept.) and Kelani Valley (both Ceylon) [*Green*]; Selangor [*Butler*]; Dindings (Straits) in November; Bayembang (Pangasinan, Phil. Is.) [*Chamberlain*]; Perak, Dacca, Calcutta.

Var. *sinensis* Theob., 1903. Monog. (iii, 180 ♀).

This variety taken by Mr. Cornford at Shaohyling, China.

Sub. species **cuneatus** Theob., 1901.

Mon. Culic., ii, 22 ♀, fig. 159, wing, head, proboscis, abdomen marks.

Culex gelidus cuneatus Giles, Jour. Trop. Med., vii, 368.

Banks says it is a fairly common mosquito, flying at early evening.

LOCALITIES: Calcutta, July, Aug. [*Annandale*]; Quilon in July [*James*]; Ceylon [*Green*]; Taipang (Perak), 21-xii-1899 [*Wray*]; Manila [*Banks*]; Pampanga (Phil. Is.) [*Whitmore*].

14. C. gnophodus Theob., 1903.

Mon. Culic., iii, 163 ♀

Closely related to *microannulatus*. Described from a unique from Dindings (Straits), taken in November.

15. C. halifaxii Theob., 1903.

Mon. Culic., iii, 231 ♀

The type is unique, and from Dindings (Straits) in December.

16. C. hirsuteron Theob., 1901.

Mon. Culic., ii, 98 ♀; fig. 196, ungues ♂, fig. 197, wing ♀

Theob. Gen. Ins. Fasc. 26, p. 27.
Culex hirsuteros Giles, Handbk., 2nd Ed., 451.
Id. *id.* Jour. Trop. Med., vii, 368.

Described from 4 specimens from Virginia sent by Prof. Howard of the United States National Museum. I include it in this Catalogue provisionally. Banks includes this species from the Philippines in his Catalogue, but doubts the identity of Giles's species with Theobald's American species from Virginia. I find no other record of any oriental locality.

LOCALITIES: Pampanga [*Whitmore*]. Also Virginia, U.S.A.

17. C. hirsutum Theob., 1901.

Mon. Culic., i, 392 ♂ ♀; pl. xx, 80 ♀, full ins. col.; fig. 137, palpus ♂, apex antennæ ♂

Types in British Museum. Theobald gives the Philippines as its habitat (Gen. Ins.), but Banks's catalogue ignores it.

18. C. impellens Wlk., 1860.

Pr. Linn. So. Lond., iv, 91 ♀

Theob. Mon. Culic., i, 362 ♀, fig. 122, head, 123, wing.
Id. l.c. iii, 161 ♂, descr.
Giles, Handbk., 2nd Ed., 405 ♂ ♀; pl. xvi, 3*a*, head, *b*, venation ♂

Theobald feels certain of having recognised this species correctly, although the thorax and wings are all that is left of the type. It is near *sitiens* and *microannulatus*; Dr. Durham has observed the larva. " Bites and breeds to a moderate extent through the cold weather in the N.-W Provinces and Punjab " (Giles).

LOCALITIES: Kuala Lumpur in July [*Durham*]; Perak [*Wray, Wright*]; Kelani Valley, Batticolora in April (Ceylon) [*Green*], N.-W. Provinces [*Giles*]; Makerian (26-x-1900) (Hoshiarpur) [*Dr. Datta*]; Makessar (Celebes) [*t. Walker*]; Pampanga, Philippines [*Whitmore*], and Calcutta.

19. C. imprimens Wlk., 1861.

Pr. Linn. So. v, 144 ♀

C. imprimiens Giles, Handbk., 2nd Ed., 411 ♀

Described from Amboina. It does not figure in Theobald's Monograph, but he mentions it in the " Gen. Ins." (incorrectly) as *imprimiens*.

20. C. infula Theob., 1901.

Mon. Culic. i, 370 ♀

Giles, Handbk., 2nd Ed., 407 ♀

A unique, from Taipang, taken by Mr. Wray jun. The usual two dates are added by Theobald (22-xi-1899 and 21-xii-1899) that appear to attend all species taken by this collector.

21. C. japonicus Theob., 1901.

Mon. Culic, i, 385 ♀

Theob. Mon. Culic., iii, 158.
? *Culex aureostriatus* Doles.

Described from a series of ♀ ♀ from Japan. Theobald says it appears in June and July (Monog. i, 386), although the only date he gives in that work is that of the Tokio examples (March).

LOCALITIES: Peradeniya (Ceyl.), 1 ♀, October [*Green*]; Tokio (8-iii-1899) [*Woods*].
N.B.—Doleschall's species is from Amboina.

22. C. longipalpis Wulp, 1892.

Mid. Sum. Dipt. 9; pl. i, 3, head.
Giles, Handbk., 2nd Ed., 423 ♀

Described from 2 ♀ ♀ from Soeroelangoen (Sumatra).

23. C. longipes Theob., 1901.

Mon. Culic., ii, 68 ♀
Giles, Handbk., 2nd Ed., 468 ♀

Described from a unique taken by Hanitsch in a house at Singapore, 4-ix-1899. Since recorded from Singapore, July 27th.

24. C. luteolateralis Theob., 1901.

Mon. Culic., ii, 71 ♂ ♀ ; pl. xxvii, 108 ♀ , full ins. col.
Giles, Handbk., 2nd Ed., 448 ♂ ♀

LOCALITIES: Perak [*Wray*]; Pampanga (Phil. Is.) [*Whitmore*]; Manila, "fairly abundant" [*Banks*]. Also in January at Durban and in March in Mashonaland.

25. C. mediolineatus Theob., 1901.

Mon. Culic., ii, 113 ♀
Giles, Handbk., 2nd Ed., 431 ♀

A unique ♀ in the British Museum from Thayetmyo (Upper Burma) [*Watson*].

26. C. microannulatus Theob., 1901.

Mon. Culic., i, 353 ♂ ♀ ; pl. xviii, 69 ♀ , full ins. col. ; fig. 118*b*, head ; *d* fore ungues ♂

Described from a good series from South India taken by James. A vicious biter, breeding in brackish water near Manila and Cavite, and allied closely to *vishnui* Theob., *sitiens* Wied., and *impellens* Wlk.

LOCALITIES: Quilon, 7-iii-1900 [*James*]; Madras [*Cornwall*]; N.-W Prov., "common" [*Giles*]; Shahjahanpur (December) [*Giles*]; Mukerian (Hoshiarpur) [*Dr. Datta*]; Peradeniya (Ceyl.) [*Green*]; Manila [*Banks*]; Cavite (Phil. Is.), close to Manila [*Stiff*]; Pangasinan (Phil. Is.) [*Chamberlain*]; also from Calcutta and the Federated Malay States.

27. C. mimeticus Noe, 1899.

Bull. Ent. So. Ital., xxxi, 240.
Giles, Handbk., 2nd Ed., 389; pl. xv, 16, wing ♀ ; 17 palpi and proboscis ♂; 18 tarsal claws ♂
Theob. Mon. Culic., i, 329 ♀ ; pl. xvi, 63 ♀ ; full ins. col.
? *hyrcanus* Pallas, Reisen Russ. Reich (1871), near Caspian Sea.

The larva has been observed in Cyprus. Giles says it "appears common in the hills of India, especially in the Nilgiri Hills, and also appears in the plains in the cooler season."

LOCALITIES: Punjab in March, 6,000 ft. [*Lindesay*]; Canara District [*Aitken*]; Theog (Simla Hills, 8,000 ft., 2-v-1907) [*Annandale*]; Kuala Lumpur [*Durham*]; Perak [*Wright*].

28. C. nigripes Zett., 1838-1840.

Ins. Lapponica, 807.

Culex nigripes Ficalbi (1896), Bull. So. Ent. Ital., 292.
Id. id. Theob. Mon. Culic., ii, 93 ♂ ♀; fig. 194, wing, ungues; ii, fig. 260 (p. 219) map of distribution.

An arctic species spreading out around the North Pole to about 35° latitude, occurring in Lapland, Greenland, Alaska, Hudson's Bay and many parts of North America, possibly also, California; its bite being said to be almost poisonous.

NOTE 1.—*Culex impiger* Wlk., List Dipt.Br. Mus. i, 6, is regarded by Theobald (Gen. Ins., p. 27) as synonymous with *nigripes* Zett., but Giles considers that it is but *pipiens* L. For wing scales see Theob. Monog.; pl. D (*impiger* Wlk.).

NOTE 2.—*Culex implacabilis* Wlk., List Dipt. Br. Mus., i, 7, is given as a synonym of *nigripes* in the Gen. Ins. (p. 27).

Dr. Neve took *nigripes* Zett. (21-viii-1899) on the Deosai Plateau between Kashmir and Shardo at an altitude of over 13,000 feet.

NOTE 3.—*Culex incidens* Thoms. (Eugenie Reise 443) was queried by Theobald in the 1st volume of his monograph as *nigripes* Zett., but in the 3rd volume (p. 193) he definitely decides that they are both distinct. This latter is not oriental.

29. C. pallidithorax Theob., 1905

Jour. econ. biol., i, 32.

India.

(?) 30. C. pipiens Linn., 1758.

Sys. Nat. Ed., x, 602.

Sch. F. Austr., ii, 628.
(For synonyms *vide* Theob. Gen. Ins. Fasc. 26.)

I do not add all the European references and synonyms to this common and typical species of the family, as it appears to me not to occur in the Orient at all.

Patton records it breeding in springs, wells and rainwater pools round D'thala and Jehag (Arabia), at an altitude of 7,000 feet, but the only claim it has to being an oriental species is the Padre Casto Elera's "Cat. de toda la faunna Filip." (1895), ii, 490, which includes it as part of the Philippine fauna; as, however, no one else has verified the species as from this region, I include it in my catalogue with a query.

NOTE.—Prof. Kertesz's Catalogue has *Culex domesticus* Germar (1817, Reise nach Dalmatien, 290) as a good species from South

Europe and the Orient, but Theobald (Gen. Ins., p. 28) sinks it as a synonym of *pipiens* L. It seems strange that a species quite common over the greater part of Europe and North America besides other regions, should be absent entirely from all parts of the Oriental Region. Possibly Theobald's *quasipipiens* may be an oriental form of this species.

31. C. pulchriventer Giles, 1901 (emendation mihi).

Jour. Bomb. So., xiii, 608 (*pulcriventer*).

Theob. Mon. Culic., ii, 48 ♂ ♀, pl. xxiii, 92 ♀, full ins. col.; fig. 170 ♂ ♀, abdominal segments, wing scales and ungues; fig. 172, wing ♂; fig. 171, wing ♀; fig. 173, larva.

Giles, Handbk., 2nd Ed., 449 ♂ ♀; pl. xvii, 1, claws, *a*, venation, *b*, head ♂, *c*, abdomen ♀, *d*, abdomen ♂, *e*, larva.

The larva has been observed by Giles in June at Naini Tal, where it breeds in clean water pools in the course of hill torrents. A sylvan species.

32. C. pullus Theob., 1905.

Ann. Mus. Hung., iii, 87 ♀, fig. 6, head.

Type in Hungarian Museum (a unique). Taken by Biro at Muina in Papua.

33. C. quasipipiens Theob., 1901.

Mon. Culic., ii 136 ♀, fig. 223, head, wing veins.
Giles, Handbk., 2nd Ed.,.438.

" Very near *pipiens* L., but differs in the venation, and in the form of the head scales, which are smaller in that species; and in the larger thoracic scales " (Theob.).

LOCALITY: Sambalpur (Cent. Prov., India) [*Murphy*].

34. C. quasiunivittatus Theob., 1901.

Mon. Culic., ii, 32 ♀, fig. 164, head.

Near *univittatus*. Described from a unique female from Mashonaland, taken in February, but Banks now records it from Pampanga in the Philippines [*Whitmore*].

35. C. reesii Theob., 1901.

Mon. Culic., ii, 145 ♂ ♀; fig. 232 palpus ♂, thorax ♀, ungues ♂

Giles, Handbk., 2nd Ed., 449 ♂ ♀

Described from 2 ♂ ♂ and 2 ♀ ♀ in Dr. Rees's collection taken by him in October at Hongkong. " Very near *pipiens*."

36. C. rizali Banks, 1906.

Phil. Jour. Sci., i, 999 ♀

Very near *japonicus* Theob. Described from two ♀ ♀ Type in Entomological Collection (No. 6083), Bureau of Science, Manila. Taken on Negros Island (Philippines) by Banks in June, on the Siya Siya Mt. of the Canlaon Volcano.

37. C. rubrithorax Macq., 1850.

Dip. Exot. Supp., iv, 9 ♀

Theob. Mon. Culic., i, 416 ♀, fig. 150, thorax, head, apex, abdomen.
Giles, Handbk., 2nd Ed., 412 ♀
Id. Jour. Trop. Med., vii, 368.
Skuse, Pr. Linn. So. N. S. Wales (1896), p. 1735.

Type in Paris Museum. At one time it was considered a spotted variety of *concolor* R. Desv., but in the "Gen. Ins." Theobald ranks it as distinct. It has been more than once incorrectly referred to as *rubithorax*. Really an Australian species, but Whitmore has taken it at Pampanga (Philippines).

38. C. sericeus Theob., 1901.

Mon. Culic., ii, 147 ♀; fig. 233, palpus, wing scales, cross veins, scutellum, thorax scale.
Giles, Handbk., 2nd Ed., 452 ♀

Described from a unique ♀ in Dr. Rees's collection taken by him at Hongkong during October.

39. C. sitiens Wied., 1828.

Auss. Zweifl., i, 542 ♀

Theob. Mon. Culic., i, 360, fig. 121, wing, proboscis.
Giles, Handbk., 2nd Ed., 400 ♀

Theobald cannot trace the type, which, when Wiedemann described it, was in Dr. Trentepohl's collection. Several species are closely allied to this, *microannulatus*, for one. Giles records it as from Taiping, but gives no exact data.

40. C. tigripes de Grandpre and de Charmay 1900.

Planters' Gazette Press.

Giles, Handbk., 2nd Ed., 407 ♂ ♀; pl. xvi, 4, wing ♂ ♀; head ♂, thorax var.
Id. Jour. Trop. Med., vii, 368.
Theob. Mon. Culic., iii, fig. 120, 121, 122, larva, pupa diagrams.

Culex maculicrura Theob., 1901, Mon. Culic., ii, 34 ♂ ♀ ; pl. xxii, 85 ♀ , full ins. col.

First described from Mauritius. Theobald, in a footnote on same page, confirms *maculicrura* as synonymous.

LOCALITIES : Dindings in December (Straits), Pampanga (Phil. Is.) [*Whitmore*] ; also Mauritius, West Africa, Natal, Queensland.

41. C. tipuliformis Theob., 1901.

Mon. Culic., ii, 327 ♀ ; fig. 306, wing, leg, abdomen.
Giles, Handbk., 2nd Ed., 443 ♂

" A very distinct species, its long legs giving it the appearance of a Tipulid " (Theob.) Described from a single female taken by Lindesay in March at Bakloh (N.-W Prov., India), 5,000 ft.

42. C. trimaculatus Theob., 1905.

Ann. Mus. Hung., iii, 86 ♀ ; fig. 5, thoracic marks.

A unique. Type in Hungarian Museum. Bombay [*Biro*].

43. C. uncus Theob., 1901.

Mon. Culic., ii, 53.
Giles, Handbk., 2nd Ed., 452 ♀

In plantains in Klang Jungle (Straits).

44. C. univittatus Theob., 1901.

Mon. Culic., ii, 29 ♂ ♀ , fig. 161, head, abdomen, leg ; pl. xxii, 86 ♀ , full ins. col.

Giles, Handbk., 2nd Ed., 428 ♂ ♀ (*univitatus*, lapsus).

A vicious biter. Really an African species, but Hanitsch has taken it at Singapore. It occurs there in July and September.

45. C. vagans Wied., 1828.

Auss. Zweifl., i, 545 ♀

Theob. Mon. Culic., i, 411 ♀ , fig. 146, wing, scutellum.
Giles, Handbk., 2nd Ed., 414 ♀ ; pl. xvi, 14, venation ♀
Id. Jour. Trop. Med., vii, 368.

The species does not appear in the " Gen. Ins." Theobald's description of it is from a single ♀ in Giles's coll.

LOCALITIES : Hongkong (October) Shanghai [*Lindesay*] ; Pampanga (Phil. Is.) [*Whitmore*].

46. C. viridiventer Giles, 1901.

Jour. Bomb. So., xiii, 609.

Theob. Mon. Culic., ii, 128 ♂ ♀, fig. 219, ungues ♂ ♀, abdominal segs., wing scales, ♂ palpus and proboscis; fig. 220, larva; pl. xxix, 116 ♀, full ins. col.

Giles, Handbk., 2nd Ed., 445 ♂ ♀; pl. xvii, 12, claw ♂, venation, abdomen, larva.

A sylvan species, bred by Giles in June and July at Naini Tal (7,000 ft.) from larvæ from pools which were open to great floodings by torrents, the recorder noting that it was difficult to understand how the larvæ could maintain their position.

LOCALITIES: Naini Tal, Katmandu (Nepal) [*Ind. Mus. Coll.*].

47. C. vishnui Theob., 1901.

Mon. Culic., i, 355 ♂ ♀, fig. 119, ungues, wing tips; fig. 120, wing ♀, 120*a* three forms of abdomen ♂ ♀; ungues ♂; pl. xvii, 66 ♀, full ins. col.

Giles, Handbk., 2nd Ed., 399 ♂; pl. xvi, 5*a* abdomen vars., 5*b* fore tarsal claws ♂

Very near *microannulatus*. In rice fields at Sambalpur.

LOCALITIES: Sambalpur, 26-x-1900 (Cent. Prov., India) [*Murphy*]; Madras, Nov., Dec. [*Cornwall*]; Quilon, 27-vii-1900 and Feb. [*James*]; Ceylon, Nov. and 27-xii-1899 [*Bartholomew*], also Dacca.

CULEX spp.

Unrecognisable except from types.

48. C. doleschalli Giles, 1900.

Handbk., 1st Ed., 338.

nom. nov. for *cingulatus* Doles. 1856, Nat. Tijd. Ned. Ind., x, 405; pl. vii, 2; from Java. (*Culex id.*)

Cingulatus was preoccupied in *Culex* by Fabricius (1805 in Sys. Antl. 36) for a species from Brazil, the type being in Copenhagen Museum. Giles adds that it is very common all the year round in houses at Ambarawa (Java). Kertesz retains both Doleschall's and Fabricius's species under *cingulatus* (as two distinct species) without comment (Cat. Dipt., 1902).

49. C. filipes Wlk., 1861.

Pr. Linn. So. Lond., v, 229 ♀

? = *molestus* Wied.

Type in British Museum, but too decayed to be recognisable. Described from Dorey (Papua).

50. C. luridus Doles., 1857.

Nat. Tijd. Ned. Ind., xiv, 384 ; pl. v, 1.
Giles, Handbk., 2nd Ed., 469.
? *inflictus* Theob., 1901, Mon. Culic., ii, 115.

Theobald ranks his *inflictus* as a good species (from Grenada) in "Gen. Ins.," but retains the queried synonymy with *luridus*.

" During dry season in houses " (Doleschall, referring to Java).

LOCALITY : Gombong, Mid-Java (*t. Doleschall*).

51. C. molestus Wied., 1821.

Dip. Exot., i, 39, and also Auss. Zweifl., i, 542.
Giles, Handbk., 2nd Ed., 470.

Type in Dr. Trentepohl's collection (defective), Sumatra.

52. C. setulosus Doles., 1857.

Nat. Tijd. Ned. Ind., xiv, 384 ; pl. v, 4.
Giles, Handbk., 2nd Ed., 470.

" During the dry season, in houses " (Doleschall), Mid-Java.

CULEX spp.

Not accounted for by Theobald in the " Genera Insectorum. "

53. C. arabiensis Patton, 1905.

Jour. Bomb. So., xvi, 633 ♂ ♀ ; pl. D, ♂ palpus, ♂ clasper.

Found breeding in rainwater tank in May on the plain near Ulub Camp. Also found in the Crater, Aden.

54. C. aureostriatus Doles., 1857.

Nat. Tijd. Ned. Ind., xvi, 385 ♀ ; pl. vi, 1.
Theob., Mon. Culic., i, 387 ♀

Included in Kertesz's " Cat. Dipt., i " ; but not in the " Genera Insectorum."

Doleschall describes it from Amboina, saying " in dwelling rooms."

Theobald queries it as a possible synonym of his *Culex japonicus*, but, pending a decision on its specific validity, I retain it as a separate species.

55. C. tritaeniorhynchus Giles, 1901

Entom., xxxiv, 192.
Jour. Bomb. So., xiii, 606.

Theob., Mon. Culic., i, 364 ♂ ♀, fig. 124, wing ♂ ♀
Giles, Handbk., 2nd Ed., 401 ♂ ♀

Theobald said (Monog., i) that he had not seen a specimen himself, but that he had seen a "rubbed example of *vishnui*" which had the appearance of *tritæniorhynchus*; repeating this opinion in Pr. Roy. So. Lond. (1902), p. 388; but he is silent on the species both in the 3rd volume of his Monograph and in the "Genera Insectorum."

LOCALITY: Travancore (South India).

56. C. ventralis Wlk., 1865.

Pr. Linn. So. Lond., viii, 103 ♀.

The second species of this name in *Culex* by Walker. Both species are given as distinct in Prof. Kertesz's Catalogue of Diptera, and the descriptions read distinct, but Theobald does not mention this second species; described from Papua. The other *ventralis* Wlk. (186 loc. cit. v, 144) is a synonym of *Desvoidya obturbans* Wlk.

TRICHOPRONOMYIA Theob., 1905.

Ann. Mus. Hung., iii, 98.

1. T. annulata Theob., 1905.

Ann. Mus. Hung., iii, 98 ♂, fig. 10 apex of proboscis, scales.

Type in Hungarian Museum (a unique).

LOCALITY: Friedrich Wilhelmshafen (Papua) [*Biro*].

TRICHORHYNCHUS Theob., 1905.

Jour. Bomb. So., xvi, 241.

1. T. fuscus Theob., 1905.

Jour. Bomb. So. xvi, 242 ♀; pl. A, fig. 2, head, palpus, clypeus, antenna, scutellum.

Described from a single perfect ♂ taken in December at Peradeniya (Ceylon).

TAENIORHYNCHUS Arrib., 1891.

Revista Mus. La Plata ii, 147, and Dipt. Argent, 47.

Tæniorhynchus as modified by Theob., 1901; Mon. Culic., ii, 190; also table of species.
Id. Giles, Handbk., 2nd Ed., 358.
Id. Theob. Gen. Ins. Fasc. 26, p. 30

The species in this genus are said to be mainly sylvan.

Prof. Goeldi has studied the life-history of *T fasciolatus*, a South American species.

1. T. acer Wlk., 1848.

List. Dipt. Br. Mus., i, 8 ♀ (*Culex*).

LOCALITIES: Friedrich Wilhelmshafen, Mt. Hanseman (Astrolabe Bay) and Yomba, all in Papua, and taken by Biro. Also occurs in Queensland and New Zealand.

2. T. ager Giles, 1901.

Entom, xxxiv, 196 ♂ (*Culex bitæniorhynchus*), and Jour. Bomb. So., xiii, 607 (*id.* *id.*).

Tæniorhynchus ager Giles in Theob., Mon. Culic., ii, 199 ♂; fig. 248, abdomen, palpus, proboscis, wing scales.

Id. *id.* Giles, Handbk., 2nd Ed., 365 ♂ ♀

The larva occurs in rice fields, April and December being given as the periods when the imago appears.

LOCALITIES: Shahjahanpur, N.-W Prov., Travancore, Ceylon, Madras [all *Giles*]; Madras [*Cornwall*].

3. T. argenteus Ludlow, 1905.

Can. Ent., xxxvii, 98 ♀

Pampanga (Luzon) [*Whitmore*].

4. T. aurites Theob., 1901.

Mon. Culic., ii, 209 ♀; fig 253, proboscis, palpus, clypeus, scutellum, scales; fig. 254, wing, wing scales; pl. xxii, 88 ♀, full ins. col.

Giles, Handbk., 2nd Ed., 362 ♀

Described from a series of ♀ ♀ in Dr. Annett's collection.

LOCALITIES: Dindings (December), Perak [*Wright*].

5. T. brevicellulus Theob., 1901.

Mon. Culic., ii, 212 ♂ ♀; fig. 255, wing (faulty), wing scales; fig. 256 ♂ ungues, ♂ palpus, ♂ antenna apex; pl. xxiii, 89 ♂ full. ins. col.; vol. iii, 268 corrects error in position of a vein in fig. 255, vol. ii.

Giles, Handbk., 2nd Ed.,363 ♀

Described from 1 ♂ and 2 ♀ ♀ from Burmese and Malay localities.

LOCALITIES: Selangor, Perak, Thayetmyo (in August), Upper Burma.

6. T. conopas Frnfld., 1867.

Ver. zool. bot. Wien., xvii, 451.

Theob. Mon. Culic., ii, 202 ♂, fig. 249, wing, wing scales, scutellum; pl. xxiii, 90 ♀, full ins. col.; pl. E, wing scales.
Giles, Handbk., 2nd Ed., 360 ♂

Described from a ♀ taken on board ship in the China seas.

LOCALITIES: Selangor 28-x-1899 [*Butler*]; Kuala Lumpur (*Durham*); Perak [*Wray*]; Formosa 8-i-1900 and June [*Ford*]; also Dindings in June and December.

7. T. lineatopennis Ludlow, 1905.

Can. Ent. xxxvii, 133.

Described from 2 perfect ♀ ♀

LOCALITIES: Bayembang in September (Pangasinan, Phil. Is.) [*Chamberlain*]; Luzon.

8. T. ochraceus Theob., 1903.

Mon. Culic., iii, 263 ♀, fig. 140, scutellum.
Very near *aurites* Theob. Described from 2 perfect ♀ ♀ from Kuala Lumpur [*Dr. Durham*].

9. T. tenax Theob., 1901.

Mon. Culic., ii, 198 ♀; pl. xvii, 65, full ins. col.
Theob. loc. cit., iii, 259, fig. 236, wing.
Giles, Handbk., 2nd Ed., 365 ♀

Very near *annulioris* Theob. The larva was found in springs and in the river by Patton in Arabia, from which land that author describes a variety as *maculipes arabiensis*.

LOCALITIES: Perak [*Wray, Wright*]; Shaohyling (China) [*Cornford*]; also from South and West Africa.

10. T. whitmorei Giles, 1904.

Jour. Trop. Med., vii, 367.

Pampanga Phil. Is.) [*Whitmore*].

MANSONIA Blanchard, 1901.

Comp. rend. So. biol. Paris, xxiii, p. 1046.
nom. nov. for *Panoplites* Theob. preoc. Gould 1853 in Aves.

Panoplites Theob., 1901, Mon. Culic., ii, 173.
Mansonia Theob. 1903, Gen. Ins. Fasc. 26, p. 31.

1. **M. annulifera** Theob., 1901.

Mon. Culic., ii, 183 ♀ (*Panoplites*), fig. 224, wing; pl. xxx, 120 ♀, full ins. col.
Panoplites annulifera Giles, Handbk., 2nd Ed., 356 ♀; pl. xiii, 8, hind leg.
Mansonia id. Theob. Mon. Culic., iii, 274.

"Occurs all over India, the Malay Peninsula and East Indies." (Theob.)

LOCALITIES: Behar (Bengal) [*Lt.-Col. Macrae*]; Madras 12-xii-1899 [*Goodrich*]; Quilon [*James*]; Perak [*Wright*]; Singapore [*Durham*]; Ceylon [t. *Banks*]; Bayembang (Pangasinan, Phil. Is.) [*Chamberlain*]; Manila [*Banks*] and *Araneta*; also Dacca.

2. **M. annulipes** Wlk., 1857.

Pr. Linn. So. Lond., i, 6 ♀ (*Culex id.*).

Theob. Mon. Culic., ii, 185 ♀; pl. xxx, 119 ♀, full ins. col. (*Panoplites*).
Panoplites dives Giles, Handbk., 2nd Ed., 356 ♀
Culex dives Sch. Reise Novara, 31.
Culex nero Doles. 1857, Nat. Tijd. Ned. Ind., xiv, 383; pl. v, 3.

Type in British Museum in fair condition. A common jungle species in the Straits; abundant at Perak.

Culex nero of Doleschall may not be synonymous, as that author says that his species is very troublesome in houses in Java, whereas *annulipes* is a sylvan species.

LOCALITIES: Selangor, 28-x-1899 and Sept. [*Butler*]; Perak, "very abundant nocturnal species" [*Wright*]; Dindings in Nov. and Dec. [*Wright*]; Kuala Lumpur [*Durham*]; Batavia [t. *Schiner*]; Rio Baco (Mindoro, Phil. Is.) [*McGregor*]; Gombong (Mid-Java) [t. *Doleschall*].

3. **M. septempunctata**, Theob., 1905.

Ann. Mus. Hung., iii, 107 ♀

Type in Hungarian Museum.

LOCALITY: Friedrich Wilhelmshafen in November (Papua) [*Biro*].

4. **M. uniformis**, Theob., 1901.

Mon. Culic., ii, 180 ♀ (*Panoplites*); pl. xxx, 118 ♀, full ins. col.
Theob. Mon. Culic., iii, 270, fig. 144, pupa.
Panoplites africanus Theob., 1901 l.c., ii, 187.
Mansonia africana id. Gen. Ins. Fasc. 26, pl. ii, 6 ♀, full ins. col.

Panoplites australiensis Theob., in MS., Giles, Handbk., 2nd Ed., 355.
var. *reversus* Theob. Mon. Culic., ii, 189.
Panoplites uniformis Giles, Handbk., 2nd Ed., 353; pl. xiii, 3, venation ♂ ♀, leptoaxis of wing vein, ♂ head.

Near *annulifera* Theob. and *titillans* Wlk. The most abundant species of the genus in the Philippines. An abundant species in South India, and occurs in the Malay Peninsula.

LOCALITIES: Shahjahanpur (N.-W Prov., India) early Oct. [*Giles*]; Quilon 7-iv-1900 [*James*]; Taiping [*Wray*]; Dilo, Friedrich Wilhelmshafen, and Ins. Graget (all Papua) [*Biro*]; Bayembang, Pangasinan, Phil. Is. [*Chamberlain*]; Manila, Rizal, Ft. McKinley [*Banks, Schultze, Craig, Araneta*].

MELANOCONION Theob., 1903.

Mon. Culic., iii, 238; pl. xii, wing scales.

Theob. Gen. Ins. Fasc. 26, p. 32.

Described by Theobald as "small black gnats which bite viciously, and which occur in swamps and woods."

1. M. ornatus, Theob., 1905.

Ann. Mus. Hung., iii, 100 ♀

Type (unique) in Hungarian Museum; taken in December by Biro at Friedrich Wilhelmshafen in Papua.

2. M. pallidiceps Theob., 1905.

Ann. Mus. Hung., iii, 101 ♀

Type in Hungarian Museum. Taken at Friedrich Wilhelmshafen (Dec.) by Biro.

POPEA Ludlow, 1905.

Can. Ent., xxxvii, 95.

Miss Ludlow says "near *Finlaya*"; Banks quotes it, "*incerta sedis.*"

1. P. lutea Ludlow, 1905.

Can. Ent. xxxvii, 96 ♂

A unique, perfect specimen taken amongst banana trees by Whitmore at Pampanga (Luzon, Phil. Is.).

FINLAYA Theob., 1903.

Mon. Culic., iii, 281; pl. xiii, wing scale.

Theob. Gen. Ins. Fasc. 26, p. 32.

1. **F. anopheloides** Giles, 1903.

Jour. Trop. Med. vi., 315 (*Mansonia id.*).

I follow Theobald in this, not having seen the above paper, but I have seen somewhere a reference to an *anopheloides* Thomson.

2. **F. aranetana** Banks, 1906.

Phil. Jour. Sci., i, 1001 ♂ ♀

Types (♂ ♀) No. 6066 in Entomological Coll., Bureau of Science, Manila. The species breeds in water in the axils of banana leaves, and the adult does not bite. Taken at Bago (Negros Is.) in the Philippines during June at an altitude of 700 metres on the Siya Siya Peak of the Canlaon Volcano.

3. **F. flavipennis** Giles, 1904.

Jour. Trop. Med., vii, 366.

Not given in the Genera Insectorum by Theobald.
LOCALITY: Pampanga (Luzon) [*Whitmore*].

4. **F. kochi** Donitz, 1901.

Insectenborse, v, 38 ♀ (*Culex*).

Theobald's description of this species in Monog., ii, 217 is from a single damaged ♀, and he notes in vol. ii, that the erection of a new genus may be required for it, but in vol. iii he decides on *Finlaya*, and also retains it here in the "Gen. Ins."

5. **F. melanoptera** Giles, 1904.

Jour. Trop. Med., vii, 367.

Not mentioned by Theobald in the "Genera Insectorum."
LOCALITY: Pampanga (Luzon) [*Whitmore*].

6. **F. poicilia** Theob., 1903.

Mon. Culic., iii, 283 ♀, fig. 156, wing scales.
poial.a Giles Jour. Trop. Med., vii, 366 (lapsus).

Described from a single, nearly perfect example.
"There is no species with which it can be confused." (Theob.)
"The ♂ will shortly be described in the "Entomologist." (Theob.)
"Bred from larvæ taken from banana trees." (Ludlow.)

LOCALITIES: Penang, 24-x-1907 [*Dr. Freear*]; Friedrich Wilhelmshafen, Seleo Berlinhafen, and Mt. Hansemann (Astrolabe Bay), all in Papua [*Biro*]; Pampanga (Luzon) [*Whitmore*]; Negros Is. (Phil. Is.) [*Banks*].

ORTHOPODOMYIA Theob., 1904.

Entom., xxxvii, 236.

" Near Finlaya."

1. **O. albipes** Leicester in Theob., 1904.

Entom., xxxvii, 237 ♂ ♀

Described from examples taken by Dr. Leicester during April in bamboo jungle, 5 miles from Kuala Lumpur.

Type in British Museum.

NOTE.—Neither this species nor the genus are included in the " Gen. Ins."

REEDOMYIA Ludlow, 1905.

Can. Ent., xxxvii, 94.

Banks considers the genus of uncertain position in the family, including it, however, in the *Culicinæ*.

1. **R. niveoscutellata** Theob., 1905.

Jour. econ. biol., i, 22; pl. iii, 5.

India.

2. **R. pampangensis** Ludlow, 1905.

Can. Ent. xxxvii, 94 ♀

Described from 3 ♀ ♀ " taken in the woods, and in the Military Quarters."

LOCALITY: Pampanga (Luzon), Sept. [*Whitmore*].

Sub. Fam. AEDEOMYINAE.

Table of Genera Giles, Handbk., 2nd Ed., 475.
Id. id. Theob. Gen. Ins. Fasc. 26, p. 34.

LEPTOSOMATOMYIA Theob., 1905.

Ann. Mus. Hung., iii, 80.

1. **L. lateralis** Theob., 1905.

Ann. Mus. Hung., iii, 110 ♂; fig. 13, head, scutellum, ungues.
Type in Hungarian Museum.

LOCALITY: Muina (Papua), Dec. 31st [*Biro*].

FICALBIA Theob., 1903.

Mon. Culic., iii, 296.
Theob. Gen. Ins. Fasc. 26, p. 36.

Allied to *Skusea*, *Verrallina* and *Uranotænia*.

1. **F. simplex** Theob., 1903.

Mon. Culic., iii, 297 ♂

Described from a perfect, unique specimen, taken by Mr. Green in September at Kurunegalla (Ceylon).

2. **F. minima** Theob., 1901.

Mon. Culic., ii, 262 ♂ (*Uranotænia id.*) ; fig. 281, wing, costal border, wing scales.
Giles, Handbk., 2nd Ed., 488 ♂

"A very distinct species" (Theob.). Described from 2 ♂ ♂

LOCALITY : Quilon, 7-iii-1900 and Febr. (*James*).

ANISOCHELEOMYIA Theob., 1905.

Entom., xxxviii, 52.

Theobald says, "near *Uranotænia*" ; Banks says, "*incerta sedis.*"

1. **A. alboannulata** Theob., 1905.

Entom., xxxviii, 55.

India.

2. **A. (?) albitarsis** Ludlow, 1905.

Can. Ent., xxxvii, 131 ♀

Described from a perfect unique. In all probability it belongs to this genus.

LOCALITY : Pampanga (Phil. Is.) [*Whitmore*].

URANOTAENIA Arrib., 1899.

Dipt. Argent. 63 (in Revista Mus. La Plata).

Theob. Mon. Culic., ii, 241, p. 241, head fig. ; p. 242 map of distribution ; p. 243 table of spp.; pl. D, wing scales.
Theob. Gen. Ins. Fasc. 26, p. 36.

1. **U. atra** Theob., 1905.

Ann. Mus. Hung., iii, 114 ♀

Type in Hungarian Museum. Described from a unique.

LOCALITY : Muina (Papua) [*Biro*].

2. **U. caeruleocephala** Theob., 1901.

Mon. Culic., ii, 256 ; fig. 276, thorax, scutellum, head, scales.
var. *lateralis* Ludlow 1905, Can. Ent., xxxvii, 385 ♀

Described from 8 ♀ ♀ in Dr. Annett's coll.

Of her variety Miss Ludlow remarks that if Theobald's type was a rubbed specimen it becomes her variety *lateralis*.

LOCALITIES: Cottabatto (Mindanao) (Phil. Is.) [*Vedder*]. Also Gambia, Sudan and old Calabar.

3. U. falcipes Banks, 1906.

Phil. Jour. Sci., i, 1004 ♂ ♀

Types No. 5210 in Entomological Coll., Bureau of Science, Manila.

LOCALITY: Rizal (Manila), February [*Banks, Schultze*].

4. U. malayi Theob., 1901.

Mon. Culic., ii, 258.
Giles, Handbk., 2nd Ed., 494 ♀

A unique.

LOCALITY: The jungle at Selangor, 28-x-1899 (Straits).

5. U. nitidoventer Giles, 1904.

Jour. Trop. Med., vii, 368.

Not given in the "Gen. Ins." by Theobald.

LOCALITY: Pampanga (Luzon) [*Whitmore*].

6. U. testacea Theob., 1905.

Ann. Mus. Hung.; iii, 113 ♀; fig. 14, basal seg. antennæ; pl. ii, wing; pl. iii, wing scales.

Described from two ♀ ♀ Types in the Hungarian Museum. Taken by Biro at Singapore.

MIMOMYIA Theob., 1903.

Mon. Culic., iii, 304.
Theob. Gen. Ins. Fasc. 26, p. 36.

Allied to *Uranotænia*. The larva of a Uganda species (*splendens* Theob.) has been observed by Dr. Low, and noticed to retain a position when in the water somewhat between that of *Anopheles* and *Culex* (*Theob.*).

1. M. chamberlaini Ludlow, 1904.

Can. Ent., xxxvi, 297 ♂

Described from a unique ♂

LOCALITY: Bayambang in Pangasinan (Phil. Is.), May [*Chamberlain*].

PHONIOMYIA Theob., 1903.

Mon. Culic., i i, 311; pl. xiv, xv (*Macrorhynchus longirostris* Theob.), wing scales ♂ ♀

Theob. Gen. Ins. Fasc. 26, p. 38.

1. P. bimaculipes Theob., 1905.

Ann. Mus. Hung., iii, 114 ♀

Described from 3 ♀ ♀ in the Hungarian Museum (types).

LOCALITIES: Moroka, July to Sept. (Papua), 1,300 metres alt. [*Loria*]; Friedrich Wilhelmshafen (Papua) [*Biro*].

2. P. indica Theob., 1905.

Ann. Mus. Hung., iii, 115 ♂ ♀; pl. ii, wing ♀, pl. iii, wing scales ♀

Types in Hungarian Museum. Theobald says "described from a perfect ♂, but though in his description of the species he does not mention the ♀ (unless the abbreviated diagnosis of 6 lines is intended to apply to both sexes) he figures a ♀ wing in pl. ii.

RUNCHOMYIA Theob., 1903.

Mon. Culic., iii, 319.
Theob. Gen. Ins. Fasc. 26, p. 38.

"Near *Dendromyia*."

1. R. philippinensis Giles, 1904.

Jour. Trop. Med., vii, 368.

Not accounted for in the "Gen. Ins." by Theobald.

LOCALITY: Pampanga (Luzon) [*Whitmore*].

WYEOMYIA Theob., 1901.

Mon. Culic., ii, 267: vol. iii, 310 (restricted).
Theob. Gen. Ins. Fasc. 26, p. 38.

1. W. aranoides Theob., 1901.

Mon. Culic., ii, 274 ♀
Giles, Handbk., 2nd Ed., 499 ♀

Straits. A unique, damaged, but Mr. Theobald believes it belongs to this genus.

2. **W greenii** Theob., 1905.

Jour. Bomb. So., xvi, 247 ♂ ♀; pl. B, 5, antenna.

Described from a perfect ♂ and ♀ The species is ignored in the "Gen. Ins." There is a *Howardina greenii* Theob. also from Peradeniya in February, but that appears to be a different species

POLYLEPIDOMYIA Theob., 1905.

Ann. Mus. Hung., iii, 118.

Near *Dendromyia* and *Phoniomyia*.

1. **P. argenteiventris** Theob., 1905.

Ann. Mus. Hung., iii, 118 ♀, fig. 15, head, scutellum, bristles.

Described from 5 ♀ ♀ Types in Hungarian Museum.

LOCALITY: *Paumomu* River (Papua) [*Loria*].

HEINZMANNIA Ludlow, 1905.

Can. Ent., xxxvii, 130 (*Heizmannia*).

Heinzmannia (Ludlow), Banks, Phil. Jour. Sci., i, 99 emendation from *Heizmannia* Ludl. (lapsus).

"Near *Dendromyia* Ludlow: incerta sedis." (Banks.)

1. **H. scintillans** Ludlow, 1905.

Can. Ent., xxxvii, 130 ♀

LOCALITY: Pampanga (Phil. Is.).

AEDEOMYIA Theob., 1901.

Mon. Culic., ii, 218; fig. 259, scales; f. 260, map of distribution.

Theob. Gen. Ins. Fasc. 26, p. 35.

1. **squamipenna** Arrib., 1878.

El. Nat. Argent., i, 151 (*Aedes squammipennis*).

Aedes squammipenna Arrib. 1891. Dip. Argent., 62.

Aedeomyia squammipenna Theob. Mon. Culic. ii, 219 ♂ ♀; fig. 261, leg tuft, wing fringe, apex ♂ antenna, ungues ♂ ♀; pl. xxxi, 124 ♀, full ins. col.; pl. E, wing scales, ol. iii, 307.

Id. *squammipennis* Theob. Gen Ins. Fasc. 26; pl. ii, 9 ♀ full ins. col.

Id. *id.* Giles, Handbk., 2nd Ed., 479.

A slightly variable species, whose bite is not severe. Common at Manila.

LOCALITIES: Madras [*Cornwall*]; Perak [*Wray*]; Seleo Berlinhafen and Friedrich Wilhelmshafen (Papua) [*Biro*]; Manila [*Banks, Schultze, Woolley*]; Ceylon. Also South America, West Indies and the Sudan.

AEDES Meig., 1818.

Sys. Besch., i, 13.
Sch. F. Austr., ii, 630.
Ficalbi Bull So. Ent. It. (1896), p. 299.

1. butleri Theob., 1901.

Mon. Culic., ii, 230 ♀
Giles, Handbk., 2nd Ed., 481 ♀

Theobald is uncertain if the species truly belongs to this genus. Described from Selangor, " Jungle; common and troublesome."

HODGESIA Theob., 1904.

Jour. Trop. Med., vii, 17.

1. H. sanguinea Theob., 1904.

Jour. Trop. Med., vii, 17.
Giles, Jour. Trop. Med., vii, 368.

Mr. Theobald considers the position of this genus uncertain, but he includes it in the *Aedeomyinæ*. Described first from Uganda, and said to be an annoying bloodsucker.

LOCALITIES: Angeles (Pampanga, Phil. Is.) [*Whitmore*]; Luzon.

Sub. Fam. CORETHRINÆ.

Giles, Handbk., 2nd Ed., 500.

CORETHRA Meig., 1803.

Illig. Mag., ii, 260.

Meig. Sys. Besch., i, 14.
Macq. Hist. Nat. i, 47.
Sch. F. Austr., ii, 623.
Wulp, Dip. Neer., 331.
Theob Mon. Culic., ii, 288, figs. 294, 295, various parts.
Id. id. i, 34 *et seq.*, larva and pupa desc. and fig.
Id. Gen. Ins. Fasc. 26, p. 42.
Giles, Handbk., 2nd Ed., 501: table of spp.

The larvæ live in almost any water, but prefer clear water (Theob.). The proboscis is not formed for biting, and they occur usually in the open country or in woods.

1. **C. asiatica** Giles, 1901.

Entom., xxxiv, 196 ♀
Theob. Mon. Culic., ii, 294 ♀; fig. 296, wing, thorax.
Giles, Handbk., 2nd Ed., 506 ♀

Described from a single ♀ in Giles's coll. taken in a house.

LOCALITY: Shajahanpur (N.-W. Prov., India) [*Giles*].

SAYOMYIA Coq., 1903.

Can. Ent., xxxv, 189.

Syn. *Corethra* Loew, *non* Meig.

1. **S. manilensis** Sch., 1868.

Reise der Novara Dipt. 30 ♂ (*Corethra id*).
Corethra maniliensis Th. Mon. Culic., ii, 300 (Sch.'s desc. transl.).
Coreth. manillensis Giles, Handbk., 2nd Ed., 504 (Sch.'s descr. transl.).
Sayomyia manilliensis Th. Gen. Ins. Fasc. 26, p. 43.

Manila.

2. **S. cornfordi** Theob., 1903.

Mon. Culic., iii, 339 ♀ (*Corethra id.*).

Described from several ♀ ♀

LOCALITY: Shaohyling (China) in May and June [*Cornford*].

ETORLEPTIOMYIA Theob., 1905.

Gen. Ins. Fasc. 26, p. 44.

Banks places this in his *Corethrinæ*, adding "*incerta sedis.*"

1. **E. luzonensis** Ludlow, 1905.

Can. Ent., xxxvii, 101 (*Oreillia id.*).
Etorleptiomyia id. Ludlow Can. Ent., xxxviii, 185.

Bayembang (Pangasinan, Phil. Is.) [*Chamberlain*].

RACHIONOTOMYIA Theob., 1905.

Jour. Bomb. So., xvi, 248.

1. **R. ceylonensis** Theob., 1905.

Jour. Bomb. So., xvi, 248 ♀ ; pl. B, 6, scutellum.

Described from a perfect unique. This genus possesses a peculiar scutellar process that differentiates it from all others, and Mr. Theobald seems to regard it as holding an isolated position.

Peradeniya, Ceylon (Oct.).

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