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AN ANNOTATED CHECKLIST OF THE MOSQUITOES OF THE SUBGENUS FINLAYA, GENUS AEDES

By Kenneth L. Knight and Elizabeth N. Marks

Since the appearance of Edwards' (1932) volume of the Genera Insectorum on the family Culicidae, the list of valid species, subspecies, and varieties belonging to the subgenus Finlaya has been increased from 101 to 165. Furthermore, many life-history stages formerly unknown have since been described. Because of this great increase in knowledge, it has been thought worth while at this time to bring Edwards' checklist up to date for this subgenus.

The scope of this list is somewhat different from that of Edwards' (1932). First, the exact original citation of the scientific name is given; second, the location of the type material and the type-locality data are presented; third, a generalized statement of the larval habitat is included; fourth, except for the original citation, the only literature references given are those that most adequately describe the stages not included in the type description; fifth, subgroups are erected and keys to both the groups and subgroups ¹ are presented.

The systematic categories of "group" and "subgroup" are used in this paper in the same sense that "genus" and "subgenus" are used by mosquito systematists, namely, as further subdivisions of apparently related species. Aside from the convenience of having these

¹ In contrast to the current system of terming as "series" all combinations below the group level, we have employed the expression "subgroup." This has been done because of its uniformity with the existing terminology of "family-subfamily" and "genus-subgenus."
additional lower categories, which is considerable where large numbers of species are involved, they have a real value in delineating relationships.

As is to be expected some of the groups and subgroups are more natural than others. For example, Groups A and E show so little divergence as to suggest that they have not developed far beyond the superspecies stage. On the other hand, Groups F and H are sufficiently heterogeneous to suggest that they probably include even unrelated species. No effort has been made to make the groups more natural by increasing their number, because of the impairment this effects on their value as taxonomic aids. In contrast to this, every effort has been made to keep the subgroups as natural as possible, regardless of how many separate units this would make necessary. As a result, it is in this category that polytypic species and superspecies may best be looked for.

Although group names have no true nomenclatorial standing, it is felt wise for the sake of simplicity to utilize previously published names where available. Consequently, except for certain necessary minor modifications, Edwards' (1932) system of group nomenclature has been employed here. The subgroup nomenclature is new with us.

Although it is felt that the term "variety" has little desirability for use in the Culicidae, varietal status has been maintained for those names designed as such in the original citations, except in the few cases where additional work has been done and they have been shown to be either full species or valid subspecies.

The keys given in the following pages are all to the adult stage only. Although many of the subgroups are distinct on larval characters, it has not been found possible as yet to write subgroup keys based on the larvae.

Where satisfactory group and subgroup revisions or treatments exist, a reference is made to them only in the discussion of the division in question and is not repeated under each involved species. Where such are not available or where additional life-history stages have since been described, the reference is listed under the individual species.

We wish to acknowledge gratefully the cooperation of the following people who made it possible for us to see the types of many of the species treated in this paper: P. F. Mattingly, British Museum; Alan Stone, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture; Mrs. J. Bonne-Wepster, Institute of Tropical Hygiene, Amsterdam; D. J. Lee, University of Sydney; and H. W. Kumm, Rockefeller Foundation, Rio de Janeiro. Many others confirmed by letters the presence or absence of types in their collections and to them we are most grateful.
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Genus Aedes Meigen

Subgenus Finlaya Theobald

Finlaya Theobald, Monograph of the Culicidae or mosquitoes, vol. 3, p. 283, 1903. (Type, pocillia Theobald.)

Finlaya Giles (error), Journ. Trop. Med. vol. 7, p. 386, 1904. (Type, pocillia Theobald.)

Gualteria Lutz, Mosquitos do Brasil, p. 47, 1904. (Type, oswaldi Lutz.)

Danciea Theobald, Entom., vol. 37, p. 78, 1904. (Type, albotaeniata Leicester.)

Hulecoctomyia Theobald, Entom. vol. 37, p. 163, 1904. (Type, trilineata Leicester.)

Popea Lutolow, Can. Ent. vol. 37, p. 95, 1905. (Type, lutea Lutolow.)

Phagomyia Theobald, Genera insectorum, family Culicidae, p. 21, 1905. (Type gubernatoris Giles.)

Lepidotomyia Theobald, Genera insectorum, family Culicidae, p. 22, 1905. (Type, magna Theobald.)


Protomaecleya Theobald, Monograph of the Culicidae or mosquitoes, vol. 4, p. 283, 1907. (Type, triseriatus Say.)

Psuedocasalippia Theobald, Rec. Indian Mus. vol. 4, p. 13, 1910. (Type, lophoventralis Theobald.)

Molpemyia Theobald, Monograph of the Culicidae or mosquitoes, vol. 5, p. 479, 1910. (Type, purpurea Theobald.)


Conopostus Dyar, Insectora Insecta Menstruus, vol. 13, p. 143, 1925. (Type, leucocontentus Dyar.)

Adult.—Palpi of male at least half as long as proboscis, rarely exceeding it in length; last two segments usually more or less swollen and hairy, but sometimes quite slender and bare. Palpi of female variable in length, ranging from about one-eighth as long as the proboscis (lacteus Knight) to fully two-thirds as long (fulgens Edwards). Proboscis slender, usually longer than front femora. Antennae of male with plumose hairs directed mostly dorsally and ventrally. Vertex dorsum and scutellum narrow- or broad-scaled, or with intermediate conditions occurring. Acrostichal and/or dorsocentral bristles present or absent, a few prescutellar bristles always present. Paratergite with or without scales. No lower mesepimeral bristles. Fore- and mid-tarsal claws toothed in both sexes, in male the larger claws usually bidentate (unidentate in stonei Knight and Laffoon); hind claws simple in both sexes. Genitalia: Male: Basistyle with apical lobe absent; basal lobe usually absent but occasionally weakly formed, or rarely even distinct (harperi Knight and leucotaeniatus Komp, for example). Dististyle simple, appendage apical. Mesostome simple and undivided. Clasper present (with a peculiar basotergal lobe in aureostriatus (Doleschall) and its related
species) and with a distinct apical articulated appendage or filament (reduced to a bristle in *disimilis* (Leicester) and its related species). **Female:** Eighth abdominal segment rather large, only slightly retractile (basal membrane of eighth segment less than 0.4 as long as eighth sternite); eighth sternite large and usually at least somewhat compressed laterally. Cerci short. Postgenital plate reaching 0.6 or more of distance to the apex of the cerci.

**Larva.**—Extremely varied, but usually having in common the following few characteristics: Siphon almost always with an acus at level of pecten teeth. Anal plate without acus, always incomplete, nearly always with spines or spicules on posterior lateral margin. Ventral brush usually with 8–12 tufts, usually borne on a sclerotized, barred area. Habitat primarily of three types: a, The water-holding spaces of living plants; b, tree holes and bamboo stumps; and c, rock holes in stream beds. A few species breed in the water collected in fallen leaves and other water-holding plant remains. A number of species have been found occasionally in artificial containers. *A. togoi* (Theobald) is found commonly in brackish rock pools along seacoasts. *A. albocnematus* (Macquart) and *A. occidentalis* (Skuse) have been reported from brackish marshes.

**Distribution.**—This very large subgenus has a world-wide distribution, being absent only from the northern rim of the Holarctic region. However, it has attained its greatest development in the Oriental region.

**Relationships.**—Morphologically this subgenus is most closely related to the subgenus *Ochlerotatus* (and quite probably derived from a common stock), the only essential differences being the absence of a distinct basal lobe on the basistyle in most species, and the shortness of the cerci and of the basal membrane of the eighth abdominal segment in the female. Also, the subgenus in general is more highly ornamented than is *Ochlerotatus*, and the larvae are found only rarely in ground pools (as are the larvae of nearly all the species of *Ochlerotatus*). As yet the larval morphology is known adequately for too few species to permit a decision as to whether valid separation characters exist in that stage. As is to be expected, some aedine species occur that are annectant between these two subgenera, and it will not be possible to settle the position of these definitely until much more morphological and biological data are available for them.

The Neotropical subgenus *Howardina* Theobald is also closely related to *Finlaya*, differing from it according to Edwards (1932) only in the simple claws of the female, the less prominent eighth sternite of the female abdomen, and the less developed claspers of the male genitalia. However, in this last respect the species
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included in Howardina show no difference at all from A. (Finlaya) dissimilis (Leicester) and its related species.

One other marked relationship needs to be mentioned and that is with the genus Haemagogus Williston. According to Edwards (1932) this genus probably represents a development from the subgenus Finlaya through some such species as A. (F.) leucocoesanus Dyar and Shannon.

Vargas (1949) has recently revived the name Gualteria Lutz for all the New World species that are at present included in Finlaya. In the absence of the evidence for this step, which is to appear in a later paper of his, it cannot be discussed at present.

The species jacobinae Serafin and Lutz, milleri Dyar, and vari-palpus (Coquillett) are excluded here from the subgenus Finlaya on the basis of female genitalic characters. The species littlechilid Taylor is believed to be a Macleaya and so is also excluded. The name pulcherrimus (Taylor) is a synonym of aegypti (Linnaeus) and has accordingly been omitted. Natvig (1948) has examined male types of fusculus Zetterstedt and found them to be Aedes (Ochlerotatus) punctor (Kirby). Consequently, the names fusculus Zetterstedt and wahlgeren Theobald have been removed from Finlaya. The position of upatensis Anduze and Hecht in Finlaya appears somewhat doubtful, but since no material has been seen it is included for the time being.

Systematics.—On the basis of ornamentation Edwards (1932) divided the subgenus Finlaya into eight groups, to which he applied the following vernacular names: Group A (kochi-group: Finlaya, s. str.), Group B (terrens-gubernatoris-group: Gualteria), Group C (longipalpis-group), Group D (chrysoleinata-group: Hulecoeteomyia), Group E (mediovittata-group: Gymnometopa), Group F (albetaeniata-group: Danielsia), Group G, and Group H.

The following changes have been made in the groups proposed by Edwards: Group G was found to be too poorly defined to be maintained and has been coalesced with Group D. In order to avoid confusion the alphabetical designations of the groups were not shifted following the removal of Group G. The word “gubernatoris” was omitted from the name of Group B for the sake of conciseness. In conformance with the policy commonly employed by Edwards (1932) of using the oldest included species name for the group title, “chrysoleinata” of Group D has been replaced by “aureostriatus,” “albetaeniata” of Group F by “alboannulatus,” and the name “geniculatus” linked for the first time with Group H. For further identification Edwards followed the practice of linking the oldest available subgeneric name to each group title. The only change made by us in this respect has been to add the term “Protomacleaya” to the title for
Group H. Edwards italicized any scientific names appearing in the
group titles, but since these titles are vernacular in nature, this policy
has not been followed here. In addition to the above, many species
have been removed to other groups.

The greatest difficulty has been encountered in defining the groups
so that the definitions would be sufficiently diagnostic to permit the
preparation of a key, and it is quite plain that the results obtained have
not been successful in all cases.

For example, the Madagascar species monetus Edwards and phillipi
van Someren, while unquestionably related to the other members of
Group C, break down the group definition in the possession of all
dark hind tarsi and will normally key to Group H (where on the basis
of scutal pattern we find monetus amazingly similar to leucocelaenus
Dyar and Shannon and leucotaeniatus Komp). This striking parallel
development of similar ornamentation patterns in species from differ-
ent groups and different geographical regions suggests that the poten-
tiality for the development of at least some of such characters is inher-
ent within the subgenus as a whole rather than within any particular
group.

Another type of problem encountered in defining and keying the
groups is illustrated by such a species as guasirubithorax (Theobald).
This species usually possesses a linear scutal marking pattern and
on the basis of this and other characters appears to belong to Group
D. However, in some specimens this scutal pattern either may be
obliterated by general pale scaling or it may be absent altogether; as
a result such specimens key to Group F.

The policy followed with marginal species has been to include them
in the group to which they appear to be most closely related on over-all
general appearance.

The question has been raised of whether or not the groups of Fin-
laya could be considered subgenera if Finlaya were to be given generic
rank once again. It is true that names are already available for all
but Group C, and that in almost all cases one has no difficulty in recog-
nizing the group to which a species belongs; yet a serious handicap to
such a plan lies in the fact that all the groups are erected on ornament-
action characters solely, and consequently, in many cases, unrelated
species are included. Additional and more relevant arguments for
the retention of the larger generic concept have been aptly phrased by
Edwards (1932) as follows: "The advantages of employing larger
generic concepts are, firstly, that the wider relationships of the species
are more clearly indicated; secondly, that limits can more readily be
assigned to the genera than in the case of more numerous and smaller
groups; and, thirdly, that it ensures the avoidance of duplication of
specific names; the use of subgeneric terms enables those who wish to
do so to make use of the smaller divisions."
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KEY TO THE GROUPS OF THE SUBGENUS FINLAYA

1. Wings profusely spotted with areas of pale and dark scaling; femora and tibiae spotted and ringed with pale scaling for nearly their whole length. Group A (koichi-group) (p. 518)

Wings not spotted;³ femora and tibiae not spotted and ringed with pale scaling for nearly their whole length................................................................. 2

2. Hind tarsi with a broad white band at base of II, usually also a narrower ring at base of I, remainder of segments dark, or V all white except possibly for one side ⁴ (III basally banded in embuensis); Ethiopian and Malagashcan species................................. Group C (longipalpis-group) (p. 525)

Hind tarsi not marked as described above.................................................... 3

3. Hind tarsi all dark scaled.............................................................................. Group H (geniculatus-group) (p. 539)

Hind tarsi with pale markings.......................................................................... 4

4. Scutal pattern consisting of a pattern of narrow longitudinal lines of white to yellow scales (in addition, there may be 1 or 3 small pale areas on anterior margin, a patch on posterior margin of anterior fossa, and a small patch before wing base)................................................................................................................................. 5

Scutal markings various in type, or absent, but not consisting largely of a pattern of narrow longitudinal pale lines ⁴...................................................... 6

5. At least the mid-femora, and usually also one or more of the tibiae, lined anteriorly with pale scales for nearly their whole length, occasionally femoral line broken and no anterior pale tibial line present. Group E (mediovittatus-group) (p. 530)

Femora and tibiae not lined anteriorly with pale scales for nearly their whole length........................................................................................................ 6

6. Hind tarsi with a basal and apical band on I (rarely no basal pale scales on I), a basal band on II (this usually about equal in size to the apical marking on I), sometimes pale scaling is present over joint between II and III or else just a few basal pale scales on III, IV and V usually all dark but in a few species possessing pale markings; in Subgroup IV the hind tarsi are dark except for a basal band on I........... Group B (terreus-group) (p. 521)

Hind tarsi with basal bands on at least the first three segments (if only on the first two then no apical bands present); sometimes one or more segments with a small amount of apical pale scaling but not with definite bands......................................................................................................................... Group F (alboannulus-group) (p. 532)

Group A (KOCHI-group; FINLAYA, s. str.)

Australasian and Oriental species. Wings profusely spotted with areas of pale and dark scaling. Scutum with a definite or indefinite variegated pattern of dark and pale scales. Femora and tibiae spotted and ringed with pale scaling for nearly their whole length. Hind tarsi variously banded or marked with pale scales.

³ May be a small basal area of pale scaling however. Also, monocotisus and bicotisus of Subgroup VIII Group F, have one and two large anterior areas of pale scales respectively.

⁴ The Madagascar species memetse and philippi, although obviously members of Group C, key to Group H because of the all-dark hind tars.

⁵ The Oriental species albicolatus var. minoriatus has three indistinct pale lines on the scutum, but also possesses a large white area before the wing base.

⁶ Some individuals of a few species of Subgroups IV, V, and VI of Group D will key to Group F owing to the linear scutal pattern being obscured by general pale scaling, or in becoming obsolete altogether. Some individuals of quadribicolor have a fairly definite anterior line on the midtibia and a less definite line on midfemur and thus would key to Group E.
Except for two species, the members of this group are remarkably uniform in general appearance and structure. On the basis of the rather marked differences of the two species in question, the group has been divided into three subgroups.

The larval head-hair arrangement is constant throughout the group (the larvae of gani and knighti are not described), hairs 4 and 6 being before the level of the antennal bases and approximately in line transversely, 7 being on a level behind that of 4 and 6, and 5 being posterior to that of 7. Comb scales are numerous and are arranged in a patch.

All the known species pass the aquatic stages in water collected in the leaf axils of plants (genus has been reported only from pitcher-plants).

Recent treatments of this group may be found in Stone and Bohart (1944), Knight and Laffoon (1946), and Marks (1947).

**KEY TO THE SUBGROUPS OF GROUP A (KOCHI-GROUP)**

1. Scales of *ppn* mostly narrow; sternites without outstanding scales apically.

   **Subgroup III, gani** (p. 521)

   Scales of *ppn* mostly, or all, broad; sternites with outstanding scales apically. 2

2. Basistyle with a prominent tuft of specialized scales; claspette filament blade-like.  

   **Subgroup I, kochi** (p. 520)

   Basistyle without an inner tuft of specialized scales; claspette filament spear-shaped in lateral view.  

   **Subgroup II, lewelleni** (p. 520)

**Subgroup I, KOCHI e. ctc.**

*Definition.*—Basistyle with a prominent inner median tuft of scales. Claspette filament blade-like. Scales of *ppn* broad, or mostly so (female of *knighti* unknown). Some sternites with outstanding scales apically.

* Included species.—A. alocasicolana Marks, ananae Knight and Laffoon, avistythus Brug, bougainvillensis Marks, croceus Knight and Laffoon, fijienis Marks, flavipennis (Giles), pahnicola Marks, knighti Stone and Bohart, kochi (Dönitz), luteus (Ludlow), medleri Knight and Laffoon, poecilius (Theobald), samoanus (Grünberg), solomonis Stone and Bohart, stonci Knight and Laffoon, and wallacei Edwards.

**Subgroup II, LEWELLENI**

*Definition.*—Basistyle without an inner median tuft of specialized scales; instead there is a row of stout setae running along the mesal tergal surface. Claspette filament long, slender, spear shaped in lateral view. Scales of *ppn* broad, or mostly so. Some sternites with outstanding scales apically.

* Included species.—A. lewelleni Starkey and Webb.
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Subgroup III, GANI

Definition.—Basistyle without an inner median tuft of scales. Claspette filament bristlelike. Scales of ppn narrow. Sternites without outstanding scales apically.

Included species.—A. gani Bonne-Wepster.

Group B (TERRENS-group: GUALTERIA)

Australasian, Oriental, Palaeartic, Nearctic, and Neotropical species. Wings not spotted with areas of pale scaling. Scutum with an area of pale scales anteriorly (greatly reduced and fragmented in uncininctus), frequently divided longitudinally down the middle by a dark scaled area, a pale scaled area before the wing base (either separate from or coalesced with the anterior pale area). Femora and tibiae not spotted and ringed, nor lined anteriorly with pale scales for nearly their whole length. Hind tarsi with a basal and an apical band on I (rarely no basal pale scales on I), a basal band on II (this usually about equal in size to the apical marking on I); sometimes pale scaling is present over the joint between II—III or else just a few basal pale scales on III, IV and V usually all dark but in a very few species possessing pale markings; uncininctus offers a marked exception to the above in having the hind tarsi dark except for a basal band on I.

In addition this group is characterized by having the general coloring black and white (not true of Subgroup VII); the mid- and hind-femora with apical pale scaling anteriorly; larval head hairs 5 and 6 in a longitudinal line, hair 6 anterior to the level of 7; and the comb scales numerous and in a patch (linear in lophoventralis). The larvae of cacharamus, cogilli, inquinatus, thorntoni, and teiliensis are not described. The larvae are usually found in tree holes, less frequently in bamboo, and occasionally even in artificial containers in wooded areas.

As Edwards (1932) has pointed out, this group has a remarkably discontinuous distribution, and yet there seems to be no doubt that the Neotropical species are closely related to those of the Oriental region (sparingly represented in the adjoining parts of the Australasian and Palaeartic regions).

The inclusion of seoulensis in Group B is undoubtedly open to question, since both the adult and larva differ in several respects from all the others; yet in general habitus it seems to belong here.

Since the male of thorntoni Dyar and Knab is unknown at present, it is impossible to determine whether it belongs in Subgroup I or II.
KEY TO THE SUBGROUPS OF GROUP B (TERREN'S-GROUP)

1. Hind tarsi dark except for a basal white band on I.
   Subgroup V, unicolor (p. 524)
   Hind tarsi with additional markings......................... 2

2. Postspiracular area scaled; hind tarsi with basal and apical bands on I-IV, V usually all white.......................... 2
   Subgroup VII, atropalpus (p. 525)
   Postspiracular area without scales; hind tarsi without the above combination of markings............................. 3

3. Scutum with an anterior area of pale scales, this sometimes divided partially or completely in the middle, a separate pale patch before wing base (if coalesced with the anterior patch then of a different shade of color); fore tibiae with an anterior dorsal white area at, or near, the apex................. 4
   Not with the above combination of characters.................. 5

4. Ppn with narrow scales only; basistyle with a prominent inner median tuft of scales.......................... Subgroup IV, tessellata (p. 524)
   Ppn with broad scales, or bare; basistyle without a tuft of specialized scales.......................... Subgroup III, gubernatoris (p. 523)

5. Hind tarsi with basal bands on I-III, narrow apical bands on I-II, a few pale scales may be present basally on IV—Subgroup VI, seoulensis (p. 524)
   Hind tarsi with basal bands on I-II, an apical band on I........ 6

6. Male palpi with numerous long hairs arising apically on III and all along IV, some also present on V, palpi not distinctly shorter than proboscis; clasper filament of male genitalia cylindrical, narrow in lateral view.
   Subgroup I, terrens (p. 522)
   Male palpi with only a few short stiff setae on last two segments, palpi only about two-thirds length of proboscis; clasper filament of male genitalia broadly expanded in lateral view—Subgroup II, argyrothorax (p. 523)

Subgroup I, TERRENS, s. str.

Definition.—Neotropical species. Male palp with numerous long hairs arising apically on III and all along IV, some also present on V. Basistyle without a specialized scale tuft. Clasper filament cylindrical, curved, bladelike in lateral view. Scutum with a large anterior area of pale scales, this frequently being partially or completely divided medially by a dark scaled area, the anterior area of pale scales not separate from (rarely very narrowly so), nor of a different color from, the patch of pale scales before the wing base. Ppn completely covered with broad pale scales. Postspiracular scales absent. Fore tibiae without an anterior white patch at or near the apex. Hind tarsi with base and apex of I and the base of II banded with pale scales, the apical band on I frequently being as broad or broader than the basal band on II (base of I dark or with only a few pale scales in type series of podographicus).

Supplementary characters.—Vertex dorsum with at least narrow scales along the longitudinal midline. Preala scaled below knob. Subspiracular scale patch present (none in males of type series of podographicus). Some of the sternites with outstanding or roughened scales apically.
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Included species.—A. terrens (Walker), t. var. metoecopus Dyar, and t. var. podographicus Dyar and Knab.

Discussion.—A rather comprehensive treatment of this subgroup may be found in Dyar (1928). However, as it stands at present Subgroup I is badly in need of some additional study.

Subgroup II, ARGYROTHORAX

Definition.—As in Subgroup I except: Male palpi with only a few short stiff setae on last two segments, the palpi themselves being only about two-thirds as long as proboscis; claspette filament broadly expanded in lateral view; and vertex dorsum broad scaled (except possibly on the ocular margin and nape).

Included species.—A. argyrothorax Bonne-Wepster and Bonne.

Subgroup III, GUBERNATORIS

Definition.—Oriental, with representatives in the Australasian and Palaearctic regions. Male palpi and basistyle as in Subgroup I (male of watasei is not described). Claspette filament curved, bladelike in lateral view. Scutum with a large anterior area of pale scales, this sometimes divided partially or completely in the middle; a separate patch of pale scales before wing base (coalesced with anterior pale area in the male of inquinatus but of a different shade of color). Ppn with a patch of broad scales, sometimes bare, when scaled the scales not covering area completely. Postspiracular scales absent. Fore tibiae with a dorsal white area near or at apex (only slightly pale in inquinatus). Hind tarsi with a basal and an apical band or spot on I, a basal band or spot on II (usually about equal to the apical marking on I), sometimes there is pale scaling over the joint between II–III or else a few pale scales basally on III.

Supplementary characters.—Vertex dorsum all broad scaled medially (may be narrow scales on ocular margin and nape, however). Prealar scale patch present or absent. Subspiracular area unscaled. Some of the sternites with outstanding or roughened scales apically.

Included species.—A. aestemensis (Theobald), cacharanus (Barraud), coglii Edwards, deccanus (Barraud), feegradei Barraud, gubernatoris (Giles), g. var. kothiensis Barraud, inquinatus Edwards, khasani Edwards, lophoventralis (Theobald), melanopterus (Giles), plumiferus King and Hoogstraal, prominens (Barraud), and watasei Yamada.

Discussion.—This subgroup constitutes a superspecies that is confined largely to the Indian subregion of the Oriental region. In general, the niveus subgroup seems to be the closest related section of the subgenus. Nearly all the species of this subgroup are treated in detail by Barraud (1934).
Subgroup IV. TSILIENSIS

Definition.—Australasian. Male palpi as in Subgroup I. Basistyle with a prominent inner median tuft of scales. Claspette filament bladelike, expanded. Scutum with a pale scaled area across the front half, at least some separate pale scales before wing base (female unknown). Ppn with the upper half covered with narrow pale scales. Postspiracular scales absent. Fore tibiae with a dorsal white area at the apex. Hind tarsi with a basal white spot and an apical ring on I, a narrower basal ring on II.

Supplementary characters.—Vertex dorsum narrow scaled. Preala scaled below knob. Subspiracular area unscaled. Sternites without outstanding or roughened scales apically.

Included species.—A. tsiliensis King and Hoogstraal.

Subgroup V. UNICINCTUS

Definition.—Oriental. Male palpi and basistyle as in Subgroup I. Claspette filament bladelike, expanded. Scutum as in Subgroup III; however the anterior pale area is greatly reduced and fragmented in female; in male the three pale areas are coalesced. Ppn with a patch of broad scales. Postspiracular scales absent. Fore tibiae with a dorsal white area at apex. Hind tarsi dark except for a basal white ring on I.

Supplementary characters.—Preala scaled below knob. Subspiracular scale patch present. Some of the sternites with outstanding or roughened scales apically.

Included species.—A. unicinctus Edwards.

Subgroup VI. SEOLENSIS

Definition.—Palaeartic. Male palpi and basistyle as in Subgroup I. Claspette filament somewhat bladelike in lateral view. Scutum with anterior half pale scaled, this connected with pale scaled area before wing bases and not of a different color from latter area. Ppn with narrow curved white scales. Fore tibiae with the apex not pale scaled anteriorly. Hind tarsi with broad basal bands on I–III, narrow apical bands on I–II, a few pale scales basally on IV.

Supplementary characters.—Vertex dorsum broad scaled (narrow ones along ocular margin and on nape). Preala scaled below knob. Subspiracular scale patch present. Sternites without outstanding or roughened scales apically.

Included species.—A. seolensis Yamada.
Subgroup VII. ATROPALPUS

Definition.—Nearctic and Neotropical. Male palpi with a few short hairs apically on III–V and only a few hairs along IV–V; palpi only about two-thirds to three-fourths as long as proboscis. Basistyle without a specialized scale tuft. Claspsette filament curved, bladelike in lateral view. Scutum with a large anterior area of yellow scales (usually divided medially by a dark scaled area), anterior area of pale scales not separate from, nor of a different color than, patch of pale scales before wing base. Ppn with broad or narrow scales above, broadened below. Postspiracular area scaled. Fore tibiae with a dorsal white area at apex. Hind tarsi with narrow basal and apical bands on I–IV, V usually all white.

Supplementary characters.—Vertex dorsum with longitudinal medial area narrow scaled. Preala scaled below knob. Subspiracular scale patch present. Sternites without outstanding or roughened scales.

Included species.—A. atropalpus (Coquillett) and a. var. epactius
Dyar and Knab.

Group C (LONGIPALPS-group)

Ethiopian species (plus three species in Madagascar). Wings not spotted with areas of pale scaling. Scutum variously marked with patches and/or straight lines of narrow curved or broad scales. Femora and tibiae not spotted and ringed, nor lined anteriorly with pale scales for nearly their whole length. Hind tarsi with a broad white ring at base of II, usually also a narrower ring at base of I, may be a few white scales at base of III, remainder of the segments dark (but female embuensis has a definite basal band one-third length of segment III; nyasae has V all white, or darkened only on one side; monetus and phillipi have the tarsi all dark). Paratergite scaled.

The males of barnardi, madagascarensis, and monetus; the female of phillipi; and the larvae of barnardi, embuensis, madagascarensis, monetus, nyasae, and phillipi are not described.

In addition, this group is characterized by the following: Male palpi with or without long hairs at apex of III and along IV and V. Basistyle without a specialized scale tuft. Claspsette filament slender, curved, not bladelike in lateral view. Ppn and scutellum with narrow curved and/or broad scales. Subspiracular area scaled or unscaled. Postspiracular area unscaled (except in madagascarensis). Female tori without prominent scale patch, may be a few small scales in some (except in madagascarensis). Larval head hairs 6 and 7 approximately in line transversely, 5 and 6 approximately in a longitudinal line, 4 level with or slightly behind 6.
There are two types of thoracic scaling in this group, in one the ornamentation is of broad metallic silvery scales \((fulgens, longipalpis,\) and \(monetus)\), in the other the ornamentation is of narrow curved pale scales (all the remaining species possess this latter type except \(phillipi\), which shows a combination of the two). The six larvae known are of two types, those with head hair 4 small and lateral comb a triangular patch of fringed scales \((fulgens, longipalpis,\) and \(pulchrithorax)\) and those with head hair 4 well developed and lateral comb a row of pointed spines \((embuensis, ingrami,\) and \(wellmanii)\). It is felt that any attempt at subdividing this group must await further knowledge of the early stages of the remaining five species. \(A. monetus\) has a patch of flat silvery scales at the base of the metapostnotum (i.e., on it) and some specimens of \(fulgens\) also have scales in that position.

The adults and pupae of many of the species of Group C have been treated by Edwards (1941), and the larvae by Hopkins (1936).

\(A.n. barnardi\) Edwards, \(embuensis\) Edwards, \(fulgens\) Edwards, \(ingrami\) Edwards, \(longipalpis\) (Grünberg), \(madagascarenensis\) van Someren, \(monetus\) Edwards, \(nyaeae\) Edwards, \(phillipi\) van Someren, \(pulchrithorax\) Edwards, and \(wellmanii\) (Theobald).

**Group D (AUREOSTRIATUS-group: HULECOETOSONYIA)**

Australasian, Oriental, Palaeartic, and Neotropical species. Wings not spotted with areas of pale scaling. Scutal marking pattern consisting largely of a pattern of longitudinal lines of white to yellow scales, may also be one or three small spots on the anterior margin, a patch on posterior margin of fossa (scutal angle), and a small patch just before the wing base (all of these patches are distinctly insignificant). Sometimes the longitudinal lines are quite diffused in outline (Subgroups II, IV, and VI), and in a few species some individuals have the lines either missing altogether or else obscured by general pale scaling. Such individuals will key into Group F. Femora and tibiae not spotted and ringed nor lined anteriorly with pale scales for nearly their whole length (some individuals of \(quasirubithorax\) have a fairly definite anterior line on mid-tibiae and a less definite line on mid-femora and would possibly key into Group E). Hind tarsal markings various, but in all, except some specimens of \(sintoni\), at least the first three segments are banded basally.

The exact position of \(wasselli\) Marks within the group is in doubt, owing to the male and larva being as yet unknown.
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KEY TO THE SUBGROUPS OF GROUP D (AUREOSTRIATUS-GROUP)

1. Postspiracular area scaled. .............................................. 2
   Postspiracular area not scaled ....................................... 5

2. Hind tarsi without apical pale markings.

   **Subgroup I. chrysolineatus** (p. 527)

3. Hind tarsi with apical pale markings on some segments .............. 3

4. Hind tarsi with narrow pale rings at base and apex of I and at base of II, in
   some specimens a few pale scales over joints of some of succeeding segments
   also; (male palpi with numerous long hairs apically on III and along
   IV) ................................................................. Subgroup III, sintoni (p. 528)
   Hind tarsi with basal and apical bands on I–IV, V either with basal band or
   else all white ...................................................... 4

5. Hind tarsal V all white; male palpi with numerous long hairs apically on III
   and along IV ................................................................ Subgroup VII, scutellarbum (p. 530)
   Hind tarsal V basally banded; male palpi with a few apical hairs on III–V,
   none or very few hairs along these segments ............................ Subgroup VI, togoi (p. 529)

Paratergite scaled .................................................................. 6
Paratergite not scaled .......................................................... 7

6. Hind tarsal segment V entirely white ...................................... Subgroup IV, quadrubithorax (p. 529)
   Hind tarsal segment V not entirely white (basally banded or with pale reflec
   tions dorsally) ................................................................ Subgroup VIII, gracilolineatus (p. 530)

7. Subspiracular area scaled; male palpi straight, III–V with a few apical hairs,
   none or very few hairs along IV–V ...................................... Subgroup II, aureostriatus (p. 528)
   Subspiracular area not scaled; male palpi with numerous long hairs apically
   on III and along IV ...................................................... Subgroup V, candidascutellum (p. 529)

Subgroup I. CHRYSLINEATUS

Definition.—Oriental, with representatives in the Palaearctic re

region. Male palpi straight; III–V with a few apical hairs, none or very few hairs along IV–V, occasionally may be up to about seven

lateral hairs on either side of IV and about four hairs along V (males

of *pallirostris* and *risali* are unknown). Basistyle without a tuft of

specialized scales. Hind tarsi with basal bands on the first 3–4 seg

ments, occasionally a few basal pale scales on V in *korelius*, no apical

pale scaling present. Postspiracular area scaled. Paratergite and

subspiracular area scaled or unscaled.

Supplementary characters.—This subgroup is a superspecies in na

ture, and is further characterized by the combination of the following charac

ters: Male palpi shorter than probosces (about three-fourths to four-fifths as long).

Claspsite filament curved, blade-like. Female

tori scaled mesally. Halter knob dark scaled on one side, pale scaled on the other.

Scutum with distinct narrow longitudinal whitish-yellow or yellow lines as follows: A distinct median line, a submedian line that tends to be broken at scutal angle (the anterior end of post

terior portion of this line frequently curved outward along the scutal

angle), and a line over the wing base (this may be just a diffused area in some species). Also, a small patch of long narrow curved scales

occurs just before the wing base. Preala scaled below knob. Larval
head hairs 4, 5, and 6 very nearly in a straight horizontal line, 7 posterior to this line. Comb scales numerous, in a patch. Larval habitat: Rock holes in stream beds, tree holes, and bamboos; less commonly Colocasia leaf axils, water collected on fallen forest leaves, and in artificial containers. The larvae of pallirostris and risali are not described.

Included species.—A. abadamontei Baisas, burgosi Baisas, chryso-lineatus (Theobald), formosensis Yamada, harveyi (Barraud), japonicus (Theobald), jugraensis (Leicester), koreicus (Edwards), harveyi var. nigromycterus Brug, pallirostris Edwards, risali (Banks), saviola Edwards, and sherki Knight.

Discussion.—The species included here have been treated by Knight (1949).

Subgroup II. AUREOSTRIATUS

Definition.—Australasian, Oriental, and Palaeartic species. Male palpi and basistyle as in Subgroup I (the male of aureostriatus is undescribed). Hind tarsi with all the segments basally banded (III—V appearing all dark in some males of okinawanus, however), some of the segments also always apically banded, V may be largely white. Postspiracular area unscaled. Paratergite unscaled. Subspiracular area scaled.

Supplementary characters.—Claspettes with a peculiar basotergal lobe bearing specialized scales. Claspette filament a twisted, rounded leaf. Female tori not scaled (may be dark hairs medially). In general, scutal markings as in Subgroup I, though usually not so distinct and sharp; in aureostriatus var. greenii the lines are obscured by general pale scaling. Preadia scaled below the knob. Larval head hairs 4, 6, and 7 inserted very nearly in a horizontal line. Comb scales numerous, in a patch. Larval habitat: tree holes and bamboos. The larvae of aureostriatus and a. var. kanaranus are undescribed.

Included species.—A. aureostriatus (Doleschall), a. var. greenii (Theobald), a. var. kanaranus (Barraud), and okinawanus Bohart.

Subgroup III. SINTONI

Definition.—Oriental. Male palpi with numerous long hairs arising apically on III and all along IV, some also present on V. Basistyle with a prominent inner tuft of specialized scales. Hind tarsi with narrow pale rings at base and apex of I and base of II, a few pale scales over joints of succeeding segments in some specimens. Postspiracular, subspiracular, and paratergite areas scaled.

Supplementary characters.—Claspette filament bladelike. Female tori with pale scales. Scutum with three small patches of pale scales on anterior margin, the lateral patches continued as a pale scaled line on each side to wing base; a line of similar scales from front on
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each side curving over wing base to lateral lobe of scutellum; prescutellar area bordered with pale scales. Preala scaled below knob. Larva not described. Larval habitat: rock pools in stream beds.

Included species.—A. sintomi (Barraud).

Subgroup IV, QUASIRUBITHORAX

Definition.—Australasian. Male palpi as in Subgroup III. Basi-style with a row of modified scalelike bristles (showing at least 1–4 striations) arising from the inner surface. Hind tarsi with basal pale bands on I–IV, V all white, I and II (sometimes also III) with apical pale scaling (very few apical pale scales present on type series of keefei). No postspiracular scales. Paratergite scaled. Subspiracular scales present or absent.

Supplementary characters.—Claspete filament blade-like. Female tori with fine hairs medially. Scutal linear pattern frequently rather diffused or clouded. Preala scaled below knob. Larval head hair 5 posterior to 6, 7 on a horizontal line between 5 and 6, 4 located between the bases of 5. Comb consisting of a curving row of scales. Larval habitat: tree holes.

Included species.—A. quasirubithorax (Theobald) and keefei King and Hoogstraal.

Subgroup V, CANDIDOSCUTELLUM

Definition.—Australasian. Male palpi as in Subgroup III. Basi-style without a specialized scale tuft. Hind tarsi with basal pale bands on I–IV, V all white, II–III with small apical pale patches, IV may rarely be all dark. Postspiracular, subspiracular, and paratergite areas unscaled.

Supplementary characters.—Claspete filament blade-like. Female tori with fine hairs medially. Scutal linear pattern very diffused. No prealar scale patch. Larval head hair 6 arising on a level with 7, 5 posterior to 6, 4 inserted between the bases of 5. Comb consisting of a patch of many scales. Larval habitat: tree holes.

Included species.—A. candidoscutellum Marks.

Subgroup VI, TOGOI


Supplementary characters.—Claspete filament whiplike. Female tori scaled medially. Scutal linear pattern sometimes partially obscured, never sharp and distinct. Preala scaled below knob. Ppn with broad scales. Larval head hairs 4, 5, and 6 in a horizontal line near the front of the head and anterior to the level of 7. Comb consisting of a patch of many scales. Anal gills globular. Larval

525017—51——8
habitat: fresh to highly saline water collected in rock pools and artificial containers near the seacoast.

Included species.—*A. togii* (Theobald).

**Subgroup VII. SCUTELLALBUM**

**Definition.**—Neotropical. Male palpi as in Subgroup III. Basistyle without specialized scale tuft. Hind tarsi with basal and apical white bands on I–IV, V all white. Postspiracular area and paratergite scaled. Subspiracular area not scaled in male (could not see this character on female).

**Supplementary notes.**—Claspete filament narrowly bladelike in lateral view. Female tori scaled medially. Scutum with a pattern of thin distinct lines. Preala scaled below knob. *Ppn* with narrow scales. Larval head hair 5 behind and slightly internal to 6, 7 on a level just anterior to 6, 4 internal to the base of 6. Comb scales in a patch. Larval habitat: rock pools in stream beds.

Included species.—*A. scutellalbum* Boshell-Manrique.

**Subgroup VIII. GRACILELINEATUS**

**Definition.**—Australasian. Male palpi as in Subgroup III. Basistyle without a specialized scale tuft. Hind tarsi with basal bands on I–V, no apical bands (V may have pale reflections dorsally in some lights). Postspiracular area bare. Subspiracular area and paratergite scaled.

**Supplementary characters.**—Claspete filament bladelike. Female tori unscaled. Scutal linear pattern with broken lateral lines, the median line more or less complete, but the lines tending to be indistinctly separated anteriorly in male. Preala scaled below knob. *Ppn* with narrow-curved scales only. Larva unknown.

Included species.—*A. gracilelineatus* Bonne-Wepster.

**Group E (MEDIOVITTATUS-group: GYMNONETOPA)**

Australasian, Oriental, and Neotropical species. Wings not spotted with areas of pale scaling. Scutal marking pattern consisting of a pattern of narrow distinct longitudinal lines of white to yellow scales. Femora (at least the mid-), and usually also one or more of the tibiae, with an anterior narrow longitudinal line of pale scales for nearly their whole length; not spotted or ringed with pale scaling. Hind tarsi with basal bands on I to IV or V (V may be all white), apical pale scaling also present on some segments (except in *mallochi, mediovittatus, and Thegnert*).

In addition the female tori possess a medial scale patch (only hairs or else just a few scales in *quinquelineatus*), and the paratergite is scaled. Larval habitat: Tree holes, bamboos, rock pools, and artificial containers.
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KEY TO THE SUBGROUPS OF GROUP E (MEDITOVITatus-GROUP)

1. Tibiae without an anterior narrow longitudinal line of pale scales, rather each with an anterior white spot shortly before middle.

Subgroup I, mediovittatus (p. 531)

Usually some of the tibiae with an anterior narrow longitudinal line (may be broken and even partially obsolete) of pale scales for most of their length. 2

2. Scutellar scales all broad..................Subgroup II, notoscriptus (p. 531)

At least a portion of scales on scutellum narrow; (postspiracular area scaled)..................Subgroup III, pseudotacnaeatus (p. 532)

Subgroup I, MEDIOVITATUS, et al.

Definition.—Neotropical. Scutellum with all broadened scales. Postspiracular area not scaled. Tibiae without an anterior narrow longitudinal line of pale scales, rather each with an anterior white spot shortly before the middle.

Supplementary characters.—Male palpi straight, with a few short apical hairs on III–V, none or very few hairs along IV–V. No prealar scale patch. Ppn with all broad scales. Head hair 6 of larva far forward, 4 slightly behind and internal to 6, 5 approximately in line with 7. Comb teeth few, in a line. Larval habitat: Tree holes and artificial containers.

Included species.—A. mediovittatus (Coquillett).

Subgroup II, NOTOSCRIPrUS

Definition.—Australasian (one Oriental species). Scutellum with all broad scales (female of n. var. montanus undescribed). Postspiracular area not scaled, except in mallochi. Tibiae with an anterior narrow longitudinal line of pale scales (on at least one pair of them).

Supplementary characters.—Male palpi with long hairs arising apically on III and all along IV and V. In abilabris, however, there are some short apical hairs on III–V, and only a few hairs along IV (males of mallochi and quinquelineatus undescribed). Preala scaled below knob. Ppn with all broad scales. Head hair 6 of larva far anterior to 5, 7 on a level near to 5, 4 near base of 6 (this arrangement is much the same as that found in Subgroup I). Comb scales numerous, in a patch. Larval habitat: Tree holes, rock pools, and artificial containers. The larvae of mallochi, n. var. montanus, and quinquelineatus are undescribed.

Included species.—A. abilabris Edwards, mallochi Taylor, notoscriptus (Skuse), n. var. montanus Brug, and quinquelineatus Edwards.

Discussion.—Judged by the different palpal types included, this is probably not a natural grouping.
Subgroup III, PSEUDOTAENIATUS

Definition.—Oriental. Scutellum with at least some narrow scales (female of hatorii undescribed). Postspiracular area scaled. Multitibiae with an anterior narrow longitudinal pale line for nearly their whole length, may be interrupted or partially incomplete.

Supplementary characters.—Male palpi with long hairs arising apically on III and all along IV, some usually on V also. Preala scaled below knob. Head hairs 4, 5, and 6 of the larva placed in an anterior transverse line, 7 posterior to this line. Comb scales numerous, in a patch. Larval habitat: Rock pools in stream beds, occasionally also in tree holes, bamboos, and artificial containers. The larvae of banksei, hatorii, and hegeri are undescribed.

Included species.—A. banksei Edwards, elaiæ (Barraud); hatorii Yamada, hegeri Causey, maojougalli Edwards, maofarlanei (Edwards), pseudotaenius (Giles), and shortyi (Barraud).

Discussion.—This is undoubtedly a superspecies. Most of the species of this group are rather completely treated by Barraud (1934).

Group F (ALBOANNULATUS-Group: DANIELSIA)

Australasian, Oriental, Neotropical, Nearctic, and Palaeartctic species. Wings not spotted with areas of pale scaling. However, monocelatus and biocellatus have one and two large anterior areas of pale scales respectively. Scutal markings various, but not consisting largely of a pattern of longitudinal pale lines (albotaenius var. mikirimens has three indistinct pale lines, but also possesses a white patch before the wing base). Femora and tibiae not spotted and ringed, nor lined anteriorly with pale scales for nearly their whole length. Hind tarsi with basal bands usually on at least first three segments, more rarely only on first one or two; if only on first two then the band on I is not smaller than that on II; sometimes one or more segments with apical pale scales. The Siberian species dekctorovi apparently belongs here but in the absence of specimens cannot be placed to subgroup.

Care must be taken in separating some individuals of a few species of Group D, which key here when their linear pattern is obscure or obsolete.

This group includes a number of more or less unrelated subgroups.

KEY TO THE SUBGROUPS OF GROUP F (ALBOANNULATUS-GROUP)

1. Vertex with dorsum broad scaled (may be narrow scales along ocular margin and on nape, however).............................................. 2
   Vertex with at least longitudinal median line of dorsum narrow scaled........... 3

2. Scutum dark scaled; ppa bare............................... Subgroup V, subsimillis (p. 536)
   Scutum with pale markings; ppa scaled............................... Subgroup I, albotaenius * (p. 533)
   Subgroup III, similensia * (p. 585)

* Apparently separable in the adult on the character of male genitalia only. Subgroup I having a prominent tuft of elongate scales on the inner surface of the basistyle and Subgroup III lacking such a group of scales.
3. Midtarsal segment I with basal pale band at least one-third length of segment (at least on outer surface).
   Australasian...Subgroup IV, purpureus (p. 535)
   Neotropical...knabi of Subgroup X, knabi (p. 538)
   Midtarsal segment I with basal pale band not more than one-fourth length of segment

4. Hind tarsi with I and II basally banded, may be a few basal pale scales on III in some specimens; (paratergite bare, postspiracular area scaled).
   Subgroup XI, fengi (p. 538)
   Hind tarsi with basal bands on at least first three segments, frequently on more

5. Anterior one-half to two-thirds of scutum largely pale scaled or with median longitudinal stripe or patch of pale scales; (femora not mottled)...6
   Without the above combination of characters (scutum various but if as above, femora are mottled)...Subgroup VI, alboannulatus (p. 536)
   Scutum marked with either a large area or a median longitudinal stripe of pale scales (either silvery white or golden) on anterior two-thirds, this pale area sharply delimited laterally and posteriorly from surrounding dark scaled areas

6. Scutum with the anterior half largely pale scaled (or at least not with a pale area that is sharply set off from dark scaled background), the margins of pale scaled area seldom sharply defined
   Subgroup II, papanesi (p. 534)
   Scutum with the anterior half largely pale scaled (or at least not with a pale area that is sharply set off from dark scaled background), the margins of pale scaled area seldom sharply defined

7. Postspiracular area scaled; paratergite bare.
   Subgroup VII, auroritans (p. 537)
   Postspiracular area bare; paratergite scaled

8. Female tori prominently scaled medially; (basistyle without a tuft of modified scales; female eighth abdominal segment not higher than broad, sternite prominently scaled; Neotropical)...Subgroup IX, fluviatilis (p. 538)
   Female tori not scaled

9. Basistyle with a tuft of modified scales; Australasian.
   Subgroup VIII, biocellatus (p. 537)
   Basistyle without a tuft of modified scales; sub-Nearctic (female eighth abdominal segment higher than broad, sternite markedly compressed laterally and bare of scales, or nearly so)...Subgroup X, knabi (p. 538)

Subgroup I, ALBOTERNIATUS

Definition.—Oriental. Basistyle with a tuft of modified scales on the inner sternal surface (the male of a. var. mikiranas is unknown). Claspette filament bladelike. Male palpi with long hairs arising apically on III, and all along IV and V. Female tori scaled, or with hairs only (female of lepchanus undescribed). Scales of vertex dorsum broad; may be narrow scales on the ocular margin and nape, however. Scutal scaling not as in Subgroup II. Hind tarsi with first three or four segments with basal pale bands, sometimes a few basal pale scales on V; may be a few apical pale scales on one or more segments. Paratergite unscaled. Postspiracular area with or without scales. Ppn with narrow scales, or else all broad scales. Neither femora nor tibiae sprinkled with pale scales anteriorly.
Supplementary characters.—Subspiracular area with or without scales. Preala scaled below knob. Scutellum with narrow scales. Larval head hair 6 anterior to 5, 4 anterior and mesad of 6, 7 on a level intermediate between those of 5 and 6 (only the larva of harperi is described). Comb teeth few, in a row. Larval habitat: bamboos. Included species.—A. albotaeniatus (Leicester), a. var. mikiranus Edwards, harperi Knight, lepchan (Barraud) (possibly a synonym of albotaeniatus), and stevensoni (Barraud).

Discussion.—This subgroup is probably not a completely homogeneous unit, since albotaeniatus, a. var. mikiranus, and lepchan all possess a postspiracular scale patch; and harperi and stevensoni lack it. Until all the larvae are known, it will probably not be possible definitely to decide this point. For a recent discussion of this subgroup see Knight (1948b).

Subgroup II. PAPUENSIS

Definition.—Australasian. Basistyle without a tuft of specialized scales (males of alticola and derooki are unknown). Claspette filament bladelike in lateral view. Male palpi as in Subgroup I. Female tori not scaled, except in anggiensis (female of clintoni unknown). Vertex dorsum with at least median longitudinal band narrow scaled. Scutum marked with either a large area or a median longitudinal stripe of pale scales (either silvery white or golden) on anterior two-thirds, this pale area sharply delimited laterally and posteriorly from surrounding dark scaled areas. Ppn with narrow scales above (may be none in dobdurus), broad below (only narrow scales present in anggiensis, toxopeusi, and alticola). Postspiracular area with or without scales. Paratergite scaled (except derooki). Hind tarsi with broad basal pale bands on at least first four segments, sometimes on all five, no apical pale scaling. Neither femora nor tibiae sprinkled with pale scales anteriorly.

Supplementary characters.—Scutellum narrow scaled. Subspiracular and prealar areas with or without scales. Larval head hairs 4, 5, and 6 in a small anterior group, hair 7 behind or level with the posterior margin of this group. Larval habitat: Tree holes, rot holes, rock pools, fallen leaves, artificial containers, and a variety of other small water-holding containers in forested areas. The larvae of alticola, anggiensis, clintoni, derooki, and toxopeusi are undescribed. Included species.—A. alticola Bonne-Wepster, anggiensis Bonne-Wepster, argenteitarsis Brug, clintoni Taylor, derooki Brug, dobdurus King and Hoogstraal, hollandius King and Hoogstraal, novalbitarsis King and Hoogstraal, palmarum Edwards, papuensis (Tay- lor), subalbitarsis King and Hoogstraal, and toxopeusi Bonne-Wepster.
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Discussion.—This subgroup is particularly distinct from all the other subgroups of Group F in the nature of the scutal scaling and in the arrangement of the larval head hairs. Some specimens of alticola may go to Subgroup VI and possibly the species is even intermediate between Subgroups II and VI. The position of this species will remain uncertain until the male and larva are described. King and Hoogstraal (1946) treat this subgroup in detail.

Subgroup III, SIMLENSIS

Definition.—Oriental. Basistyle without a tuft of specialized scales (male of simlensis is undescribed). Claspette filament blade-like. Male palpi as in Subgroup I. Female tori scaled medially. Vertex dorsum broad scaled (may be narrow scales along ocular margin and on nape). Scutal scaling not as in Subgroup II. Ppn with at least some narrow scales. Postspiracular area not scaled. Paratergite without scales, a few present in simlensis, however. Neither femora nor tibiae sprinkled with pale scales anteriorly. Hind tarsi with first three to four segments with basal white bands, sometimes a very few apical white scales on one or more segments.

Supplementary characters.—Scutellum with narrow scales. Subspiracular area with or without scales. Preala scaled below knob. Type of larval head hairs widely different in albocinctus and gilli, being well developed and branched in first, and with 5 and 6 very long and single in latter (the larva of simlensis is undescribed). Comb teeth numerous, in a patch. Larval habitat: tree holes.

Included species.—A. albocinctus (Barraud), gilli (Barraud), and simlensis Edwards.

Discussion.—On the basis of the larval difference mentioned above, it is believed that this is not a natural subgroup. The adults of this subgroup can be separated from those of Subgroup I only on the absence of a tuft of modified scales on the basistyle. For a comprehensive discussion of the species included here, see Barraud (1934).

Subgroup IV, PURPUREUS (Malpemysia)

Definition.—Australasian. Basistyle without a tuft of specialized scales. Claspette filament blade-like in lateral view. Male palpi as in Subgroup I. Female tori with dark hairs medially (in some specimens of auridorsum there are a few small flat dark scales here). Vertex dorsum with narrow scales. Scutal scaling not as in Subgroup II. Postspiracular area bare. Paratergite scaled. Neither femora nor tibiae sprinkled with pale scales anteriorly. Hind tarsi with basal bands on I—III, rarely on IV; V sometimes pale in auridorsum.

Supplementary characters.—Scutellum with narrow scales. Subspiracular area with or without scales. Preala scaled below knob.
Approximately basal one-half of hind femur creamy scaled anteriorly. White band on midtarsal segment I at least one-third length of segment. Dark scales on abdomen, legs, etc., with purplish reflections. Head hair 6 of larva anterior to 5, 4 between bases of 6, 7 on a level between those of 5 and 6. Comb scales few, in a line. Ventral brush borne on a modified sclerotized plate separate from the anal plate. Larval habitat: tree holes.

Included species.—*A. auridorsum* Edwards and *purpureus* (Theobald).

Discussion.—The relationship of the two species included here would be somewhat in doubt were it not for the marked similarity between the larvae.

Subgroup V, subsimilis


Supplementary characters.—Scutellar scales broad. Larva undescribed.

Included species.—*A. subsimilis* (Barraud).

Discussion.—The only specimen that has been seen by us is the type, and the pin has so obliterated the pleuron on this specimen that it is impossible to determine which scale patches are present.

Subgroup VI, Alboannulatus, *n.* str.

Definition.—Australasian. Basistyle without a tuft of specialized scales (male of *occidentalis* not specifically described). Claspette filament slender bladelike in lateral view. Male palpi as in Subgroup I. Female tori with or without scales. Vertex dorsum narrow scaled. Scutal scaling various, often with indefinite lines or patches, not as in Subgroup II. *Ppn* with narrow-curved and/or flat scales. Postspiracular area with or without scales. Paratergite scaled. In some species femora, and sometimes the tibiae also, with anterior surface sprinkled with pale scales. Hind tarsi with segments I–IV or V basally banded (the bands not extending onto the apices of preceding segments).

Supplementary characters.—Scutellum with narrow curved scales. Subspiracular area scaled. Larval head hairs 6 and 7 approximately in a horizontal line, 5 slightly caudad and mesad to 6, 4 mesad to 5. Comb scales numerous and in a patch. Larval habitat: Fresh-
water ground and rock pools, occasionally in brackish marshes, fallen palm fronds, holes in fallen logs, and other similar containers. Larva of mackerrasi undescribed.

Included species.—A. abovannulatus (Macquart), mackerrasi Taylor, occidentalis (Skuse), and o. var. masoni (Taylor).

Subgroup VII. AURONITENS

Definition.—Oriental. Basistyle without a tuft of specialized scales. Claspette filament bladelike in lateral view. Male palpi with some hairs at the apices of III–V, none or very few along IV and V. Female tori with pale scales medially. Vertex dorsum narrow scaled. Scutal scaling not as in Subgroup II. Ppn with both narrow and broad scales. Postspiracular area scaled. Paratergite without scales. Neither femora nor tibiae sprinkled with pale scales anteriorly. Hind tarsi with the first 3–4 segments basally banded, sometimes a few pale scales apically.

Supplementary characters.—Scutellar scales narrow. Subspiracular and prealar areas scaled. Larval head hairs, 4, 6, 7 approximately on a transverse line, 5 slightly behind and mesad of 6. Comb scales numerous, in a patch. Larval habitat: tree holes.

Included species.—A. auronitens Edwards and christophersi Edwards.

Discussion.—For a comprehensive treatment of these species see Barraud (1934). On the basis of the similarity of male genitalia and larva, this would appear to be a rather natural grouping. The larvae of a. var. greenii and gillii show considerable relationship to those of this subgroup.

Subgroup VIII. BIOCELLATUS

Definition.—Australasian. Basistyle with specialized scale tuft (male of australiensis unknown). Claspette filament bladelike in lateral view. Male palpi as in Subgroup I. Female tori with only fine hairs medially. Vertex dorsum narrow scaled. Scutal scaling not as in Subgroup II. Ppn with at least some narrow scales. Postspiracular area bare. Paratergite scaled. Neither femora nor tibiae speckled anteriorly with pale scales. Hind tarsi with first three or four segments basally banded.

Supplementary characters.—Scutellum with at least some narrow scales. Subspiracular area with or without scales. Prealar scaled below knob. Larval head hairs 4, 6, and 7 approximately in a transverse line; 5 inserted a short distance posterior to 6, 4 unusually large. Comb scales in an irregular line, or numerous in a patch. Larval habitat: tree holes.
Included species.—A. australiensis (Theobald), biocellatus (Taylor), and monocellatus Marks.

Discussion.—Scales on the scutum of the three species included here are fairly uniform in size, though the density of the scaling may vary; australiensis has the posterior margin of the pale scaled area on the scutum sharply defined, but differs from Subgroup II in having no dark scaling on the anterior half of scutum.

Subgroup IX, FLUVIATILIS

Definition.—Neotropical. Basistyle without a tuft of specialized scales. Claspette filament bladelike in lateral view. Male palpi as in Subgroup I. Female tori scaled medially. Vertex dorsum with narrow scaling at least medially. Scutal scaling not as in Subgroup II. Ppn largely narrow scaled. Postspiracular area without scales. Paratergite scaled. Neither femora nor tibiae speckled anteriorly with pale scales. Hind tarsi with I-IV basally banded, may be a few basal pale scales on V; one or more segments may have some apical pale scaling.

Supplementary characters.—Scutellum with narrow scales. Subspiracular area scaled. Preala scaled below knob. Larval head hair 5 posterior and slightly mesad to 6 and approximately on a transverse line with 7, 4 mesad of 5. Comb scales numerous, in a patch. Larval habitat: rock pools in stream courses.

Included species.—A. fluviatilis (Lutz).

Subgroup X, KNABI

Definition.—Neotropical and sub-Nearctic. Claspette filament nearly cylindrical, curved and appearing bladelike in lateral view however (the male of knabi is undescribed). White band on midtarsal segment I usually only about one-fourth length of segment in sosophus. Basal bands on hind tarsal segments I-IV, may be a few basal pale scales on V. Midlobe of scutellum broad scaled, lateral lobes narrow scaled. Ventral brush of larva not on a plate. Subspiracular area scaled. Remainder as in Subgroup IV.

Included species.—A. knabi (Coquillet) and sosophus Dyar and Knab.

Subgroup XI, FENGI

Definition.—Palaeartic. Basistyle without a specialized tuft of scales. Claspette filament bladelike in lateral view. Male palpi with long hairs arising apically on III, and all along IV. Female tori scaled. Vertex dorsum narrow scaled. Scutal scaling not as in Subgroup II. Ppn scaling broad and spindle shaped. Postspiracular area scaled. Paratergite bare. Neither femora nor tibiae sprinkled with pale scales anteriorly. Hind tarsi with I and II basally banded, may be a few basal pale scales on III in some specimens.
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Supplementary characters.—Scutellar scales narrow. Subspiracular area scaled. Prealar scaled below knob. Larval head-hair arrangement not described. Comb scales in a line. Larval habitat: bamboo stumps.

Included species.—A. fengi Edwards.

Discussion.—This species shows some relationship to unioincus in Group B.

Group II (Geniculatus-group; Protomacleaya)

Australasian, Oriental, Palaearctic, Neotropical, and Nearctic species. Wings not spotted with areas of pale scaling. Scutal markings various, but not consisting largely of a pattern of longitudinal pale lines (except in eatoni where it is entirely of lines except for a small patch before wing base), nor as in Group B. Femora and tibiae not spotted and ringed, nor lined anteriorly with pale scales for nearly their whole length. Tarsi completely dark.

In the absence of specimens or additional descriptive information, it has not been possible to assign either peipingensis Feng or yimnanensis (Gaschen) to subgroups.

This group includes all of the dark-legged Finlaya species known except the two Madagascar species monetus and philippi (which on general relationships are placed in Group C in this paper).

KEY TO THE SUBGROUPS OF GROUP II (GENICULATUS-GROUP)

1. Paratergite not scaled. Subgroup I, niveus (p. 539)
   Paratergite scaled. 2

2. Ppn with broad flat overlapping silvery scales; no postspiracular, subspiracular, or prealar scales. Subgroup II, dissimilis (p. 540)
   Not with the above combination of characters. 3

3. Scales of vertex dorsum broad (may be narrow scales along eye margin and on nape); (male palpi without numerous long hairs along IV and V) Subgroup VII, leucocelaenus (p. 542)
   Scales of vertex dorsum narrow, at least along longitudinal midline. 4

4. Basistyle with a tuft of specialized scales on the inner surface; (female tori and postspiracular area scaled) Subgroup III, pulchriventer (p. 541)
   Basistyle without a tuft of specialized scales. 5

5. Female tori scaled; (postspiracular area scaled, upper ppn scales narrow). Subgroup V, suffusus (p. 541)
   Female tori not scaled.

   Oriental. Subgroup IV, oreophilus (p. 541)
   Nearctic and Palaearctic. Subgroup VI, geniculatus (p. 541)

Subgroup I, Niveus

Definition.—All Oriental species, except one Australasian and one Palaearctic species. Basistyle with a specialized scale tuft (males of idjenensis and pseudoniveus undescribed). Claspete filament blade-like. Male palpi with sparse long hairs apically on III, and along IV and V. Female tori bare of scales (female of niveoides un-
described). Vertex dorsum broad scaled (may be narrow scales along eye margin and on nape, however). *Ppn* bare, or nearly so. Paratergite and postspiracular area without scales.

*Supplementary characters.—*Black and white species. Scutum with at least anterior one-half covered with white scales; this may be partially or completely divided medially by dark scales (in *idjenensis* the pale scutal scales are pale golden). Scutellar scales broad. Subspiracular area without scales. Preala scaled below knob (scales absent in *dorseyi*). No femora knee spots. Larval head hair 6 anterior to 5, 4 between bases of 6, 5 and 7 approximately in line. Comb teeth few, in a line. Larval habitat: Tree holes, bamboos, and artificial containers. The larvae of *idjenensis* and *pseudoniveus* are undescribed.


*Discussion.—*This subgroup, which is probably a superspecies, has been treated by Knight (1946).

**Subgroup II. DISSIMILIS**

*Definition.—*Oriental. Basistyle without a specialized scale tuft (males of *d. var. karvari* and *leucomeres* unknown). Claspette filament needlelike. Male palpi with a few hairs on apices of III–V, none or very few along IV–V (the palpi of *dissimilis* is as in the *niveus* group, however). Female tori bare (female of *leucopleurus* undescribed). Vertex dorsum broad scaled (may be narrow scales along eye margin and on nape, however). *Ppn* with broad, flat, silvery scales. Postspiracular area without scales. Paratergite scaled.

*Supplementary characters.—*Scutum clothed with black scales, sometimes an anterior variable central area of golden scales present. Scutellar scales broad. Subspiracular and prealar areas without scales. Some femora with anterior white just before apex; midfemora with an anterior median silvery mark. Larval head hairs 4, 6, and 7 approximately in line, 5 posterior to and near to 6. Comb scales in a patch. Larval habitat: Tree holes, bamboos, and artificial containers. Larvae of *d. var. karvari* and *leucomeres* unknown.

*Included species.—* *A. dissimilis* (Leicester), *d. var. karvari* (Barraud), *leucomeres* (Giles), *leucopleurus* Rozeboom, *lusonensis* Rozeboom, and *paradissimilis* Rozeboom.

*Discussion.—*The species of this subgroup constitute a well-delimited superspecies. Rozeboom (1946) has treated this subgroup fully.
Subgroup III, Pulchriventer

Definition.—Oriental. Basistyle with a scale tuft. Claspete filament bladelike. Male palpi with hairs apically on III, and along IV and V. Female tori scaled. Vertex dorsum mostly narrow scaled. Ppn with all broad scales. Postspiracular and paratergite areas scaled.

Supplementary characters.—Scutum largely covered with golden scales. Scutellar scales narrow. Subspiracular and prealar areas scaled. Femoral knee spots present. Larval head hairs 5, 6, and 7 in a convex row toward front, 4 slightly posterior and internal to 5, all with several branches. Comb scales numerous, in a patch. Larval habitat: rock pools in stream beds.

Included species.—A. pulch riventer (Giles).

Subgroup IV, Oreophilus


Supplementary characters.—Scutum in female with pale scales arranged in lines, in male entirely covered with pale scales. Scutellar scales narrow. Subspiracular and prealar areas scaled. Femoral knee spots present. Larval head hairs 4, 6, and 7 in a transverse row that is slightly posterior to antennal bases, hair 5 some distance posterior to 6. Median mouthbrush hairs with comblike spicules. Comb scales numerous, in a patch. Larval habitat: tree holes.

Included species.—A. oreophilus (Edwards).

Subgroup V, Suffusus

Definition.—As in Subgroup IV except: Scutum covered with pale scales, a pair of indistinct submedian dark lines present on female. Female tori scaled. Vertex dorsum with narrow scaling. Scutellar scales narrow. Ppn with scales on upper part narrow. Postspiracular and prealar areas scaled. Larval head hairs, 4, 6, and 7 in a transverse row slightly posterior to antennal bases, 5 slightly internal and posterior to 6. Median mouthbrush hairs simple. Comb of a few teeth in an irregular row. Larval habitat: tree holes.

Included species.—A. suffusus Edwards.

Subgroup VI, Geniculatus (Protomacleaya, s. str.)

Definition.—Palaeartic and Nearctic. Basistyle without a specialized scale clump. Claspete filament slightly broadened (bristle-like in Eaton). Male palpi hairy (only a few long hairs in Eaton).
Female tori not scaled (female of eatoni unknown). Vertex dorsum with narrow scaling. Ppn broad scaled, or else narrow scaled at least in part. Postspiracular area with or without scales. Paratergite scaled.

**Supplementary characters.**—Scutal pattern various. Scutellar scales narrow, or partially broad. Subspiracular and prealar areas scaled. Femoral knee spots present. Larval head hair 6 directly anterior to 5, 7 on a line between 5 and 6, 4 anterior to 6. Comb scales few, in a line. Larval habitat: tree holes, and more rarely artificial containers. Larva of eatoni unknown.

**Included species.**—A. eatoni (Edwards), echinus (Edwards), geniculatus (Olivier), triseriatus (Say) and t. var. hendersoni Cockerell.

**Discussion.**—In some respects eatoni appears to be more related to Group C, madagascarensis in particular, than it does to the other species included here.

**Subgroup VII. LEUCOCELAENUS (CONOFOSTEGUS)**

**Definition.**—Neotropical. Basistyle with a specialized scale tuft. Clasperate filament bladelike. Male palpi without hair tufts. Female tori not scaled. Vertex dorsum broad scaled (may be narrow scaled along eye margin and on nape). Ppn with broad overlapping white scales. Postspiracular and paratergite areas scaled.

**Supplementary characters.**—Scutum with a large patch of broad silvery scales before the wing base and a median longitudinal band of broad silvery scales. Scutellar lobes clothed with broad flat scales. Subspiracular and prealar areas scaled. Mid- and hind-femora with kneespots; midfemora with an anterior white spot beyond the middle. Larval comb with teeth few, in a line. Larval habitat: tree holes. Larva of leucotaeniatus unknown.

**Included species.**—A. leucoelenaenus Dyar and Shannon and leuco-taeniatus Komp.

**CHECKLIST**

[An asterisk after the location of the type material indicates that it has been examined by one of us.]

**Group A (KOCHI-group: FINLAYA, s. str.)**

aloacisicola Marks

Queensland; New South Wales


**Type:** Male (holotype) in University of Queensland.* **Type locality:** Australia: Mount Glorious, Queensland (Wassell).

**Habitat:** Axils of cunjevoi.
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ananae Knight and Laffoon


avistylus Brug

Malay Archipelago; Celebes; Butoen; Kabaena; Morotai

Aedes (Finlaya) flavipennis (Giles) var. avistylus Brug, 1939. Tijdsch. v. Ent., vol. 82, p. 107 (male, female, larva). Type: Male (holotype) in British Museum.* Type locality: Butoen: Bace-Bace (Brug). Habitat: Axils of Colocasia; bamboo.

bougainvillensis Marks

Solomon Islands


croceus Knight and Laffoon

Philippines


fijiensis Marks

Fiji


flavipennis (Giles)

Philippines


* Banks' cotype series in Manila was destroyed during World War II. A lectotype has therefore been selected at this time from 3 cotypes (1 male, 3 females) deposited by Banks in the U.S.N.M.
Type Locality: Philippines: Bago, at Mailum and on Siya-Siya Peak, Canloam Volcano, 700 meters, Negros Occidental Province, Negros Island (Banks).

gahnicola Marks

Queensland


gani Bonne-Wepster

New Guinea


knighti Stone and Bohart

Solomon Islands


kochi (Döntitz)

Queensland; New Guinea; New Britain?; New Ireland?


lewelleni Starkey and Webb

Palau Islands


luteus (Ludlow)

Philippines

MOSQUITOES OF THE SUBGENUS FINLAYA—KNIGHT AND MARKS 545

medleri Knight and Laffoon

*Type*: Male (holotype) in U.S.N.M.*  
*Type locality*: Philippines: Jimasoc Island (Leyte-Samar area) (Medler).  
*Habitat*: Axils of pandanus, banana, taro, and abaca.

poecilius (Theobald) Netherlands New Guinea; Simalur; Lombok; Java; Sumatra; Celebes; Borneo; Malay; Philippines; Burma; India

*Type*: Female (holotype) in British Museum.*  
*Type locality*: Malay Peninsula: Penang (Freer).  
*Habitat*: Axils of aroid-type plants, banana, abaca, and pandanus.

samoanus (Grünberg)

*Type*: Four females (cotypes) in Zoological Museum, Berlin.  
*Type locality*: Samoa: Apia, Upolu (Friedrichs).  
*Habitat*: Axils of *Colocasia*, *Alocasia*, and wild araceae.

solenonis Stone and Bohart

*Type*: Male (holotype) in U.S.N.M.*  
*Type locality*: Solomon Islands: Guadalcanal (Lechner).  
*Habitat*: Axils of palms and taro.

stonei Knight and Laffoon

*Type*: Male (holotype) in U.S.N.M.*  
*Type locality*: Philippines: Duong, Basye Municipality, Samar Island (Zolik).  
*Habitat*: Axils of banana, pandanus, taro, and abaca.

wallacei Edwards

New Ireland; New Guinea; New Britain  
(female).  
*Type*: Female (holotype) in British Museum.*  
*Type locality*: New Ireland: Kavieng (Kaewung) (Wallace).  
*Habitat*: Axils of banana, taro, pineapples, and pandanus.
Argyrothorax* Bonne-Wepster and Bonne


Assamensis (Theobald) Indo-China; Java; Assam; India; Yunnan

* Stegomyia assamensis* Theobald, 1908. Rec. Indian Mus., vol. 2, p. 290 (female). **Type:** Female (holotype) in collection of Zoological Survey of India, Calcutta. **Type locality:** Assam: Sylhet (Hall). **Habitat:** Tree holes.

Atropalpus* (Coquillett) Eastern United States

* Culex atropalpus* Coquillett, 1902. Can. Ent., vol. 34, p. 292 (male, female). **Type:** Male, female (cotypes) in U.S.N.M.* **Type locality:** United States: Richmond, Va. (Williams); Plummer's Island, Montgomery County, Md. (Currie and Barber); Shenks Ferry, Pa. (Weber); White Mountains, N. H. (Morrison). **Habitat:** Rock holes in stream beds. **Remarks:** Male, female, and larva are well described by Carpenter, Middlekauff, and Chamberlain, Mosquitoes of the southern United States, p. 220, 1946.

Atropalpus var. epactius* Dyar and Knab Mexico; Central America

* Aedes epactius* Dyar and Knab, 1908. Proc. U. S. Nat. Mus., vol. 32, p. 53 (male, female). **Type:** Male, female (cotypes) in U. S. N. M.* **Type locality:** Mexico: Córdoba and Almoloya, state of Oaxaca (Knab). **Habitat:** Rock holes in stream beds. **Remarks:** Larva not specifically described.

* Aedes (Culiseta) perichaera* Dyar, 1921. Insector Insctiae Menstruus, vol. 9, p. 36 (male, female). **Type:** Male, female (cotypes) in U. S. N. M.* **Type locality:** Costa Rica; Circuelas (Alfaró).

Cacharana* (Barraud) Assam; India


Cogilli Edwards Southern India

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p. 92 (female). **Type:** Females (cotypes) in British Museum.*
**Type locality:** India: Karwar, northern Kanara (Cogill).
**Habitat:** Tree holes and bamboos. **Remarks:** Larva not described.

deccanus (Barraud)

*Finlaya deccana* Barraud, 1923. Indian Journ. Med. Res., vol. 11, p. 217 (male, female). **Type:** Male, female (cotypes) in British Museum.* **Type locality:** India: Belgaum, Bombay, Deccan (Barraud). **Habitat:** Tree holes.

feegradei Barraud

*Aedes (Finlaya) feegradei* Barraud, 1934. Fauna Brit. India, vol. 5, p. 164 (male, female, larva). **Type:** Male, female (cotypes) in British Museum. **Type locality:** Burma: Rangoon (Feegrade). **Habitat:** Tree holes.

gubernatoris (Giles)


gubernatoris var. kotiensis Barraud

*Aedes (Finlaya) gubernatoris* (Giles) var. kotiensis Barraud, 1934. Fauna Brit. India, vol. 5, p. 161 (male, female, larva). **Type:** Male, female (cotypes) in British Museum. **Type locality:** Western Himalayas: Koti, near Kalka (Barraud). **Habitat:** Tree holes.

inquinatus Edwards

Western Himalayas; Nilgiri Hills, India
*Aedes (Finlaya) inquinatus* Edwards, 1922. Indian Journ. Med. Res., vol. 10. p. 267 (male, female). **Type:** Male (holotype) in British Museum.* **Type locality:** India: Simla (Christophers). **Habitat:** Tree holes. **Remarks:** Larva not described.

khazani Edwards

*Aedes (Finlaya) khazani* Edwards, 1922. Indian Journ. Med. Res., vol. 10, p. 266 (male, female). **Type:** Male (holotype) in British Museum.* **Type locality:** India: Pudupadi, Malabar coast (Khazan Chand). **Habitat:** Tree holes.
lophoventralis (Theobald)  India

melanopterus (Giles)  Philippines

plumiferus King and Hoogstraal  New Guinea

prominens (Barraud)  India; Indo-China; China; Celebes

seoulensis Yamada  Korea

terrens (Walker)  Mexico to Brazil; Argentina
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*Gualteria Oswaldi* Lutz, 1904. In Bourroul, Mosquitos do Brasil, p. 47 (sex not given). **Type**: Nonexistent. **Type Locality**: Brazil: Rio de Janeiro, Minas e Sao Paulo. **Remarks**: On p. 47 no definition is given; on p. 66 the combination is *Haemagogus Oswaldi* Lutz, and here a definition is given.

terrens var. metoecopus Dyar


terrens var. podographicus Dyar and Knab


*thorntoni* Dyar and Knab

MARKS: Larva not known from Nicaragua. It is doubtful that material recorded from Panama by authors is conspecific.

tsiiliensis King and Hoogstraal

_Aedes (Finnaya) tsiiliensis_ King and Hoogstraal, 1946. Journ. Washington Acad. Sci., vol. 36, p. 305 (male). Female unknown. **TYPE:** Male (holotype) in U.S.N.M.* **TYPE LOCALITY:** New Guinea: Tsili Tsili on the Watut River, a branch of the Markham River (King). **HABITAT:** Tree hole. **REMARKS:** Larva not described.

unicinctus Edwards


watasei Yamada


_group C (LONGIPALPIE-group)_

barnardi Edwards

_Aedes (Finnaya) barnardi_ Edwards, 1924. Ann. South African Mus., vol. 19, p. 161 (female). Male unknown. **TYPE:** Female (cotypes) in Capetown and British Museum.* **TYPE LOCALITY:** Africa: Oudebosch, Cape Province (Barnard). **HABITAT:** ? **REMARKS:** Larva unknown.

evbuensis Edwards


fulgens (Edwards)

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Type: Male (holotype) in British Museum.  
Type locality: Madagascar: Sakaramy, near Diego Suarez.  
Habitat: Tree holes.  
Remarks: Larva not described.

Pulchritudax Edwards  
Aedes (Finlaya) pulchritudax Edwards, 1939.  
Type: Male (holotype) and female (allotype) in British Museum.  
Type locality: Africa: Nairobi, Kenya (MacDonald).  
Habitat: Tree holes.  

Wellmanii (Theobald)  
Danielea wellmanii Theobald, 1905.  
Entomologist, vol. 38, p. 103 (female).  
Type: Female (holotype) in British Museum.  
Type locality: Africa: Bihe, Angola (Wellmann).  
Habitat: ?  

Group D (Aureostriatus-group: Hulecoeteomyia)

Abadsantesi Baisas  
Aedes (Finlaya) abadsantesi Baisas, 1946.  
Type: Male (holotype) in Philippine Bureau of Health, Manila.  
Male genitalia examined.  
Type locality: Philippines: Llaven, Infanta Municipality, Luzon Island (Baisas).  
Habitat: Rock holes in stream beds.

Aureostriatus (Doleschall)  
Sumatra; Java; Celebes; Kabaena; Alor; Soembawa; Timor; Ceram; Amboina; Dutch New Guinea

Culex aureostriatus Doleschall, 1851.  
Male not specifically described.  
Type: Nonexistent.  
Type locality: Amboina.  
Habitat: Tree holes.  
Remarks: Larva not described.

Aureostriatus var. greenii (Theobald)*  
India; Ceylon; Assam; Sumatra; Java

Hovardina Greeni Theobald, 1908.  
Type: Female (holotype) in British Museum.  
Type locality: Ceylon: Peradeniya (Green).  
Habitat: Tree holes and bamboos.

* Varietal status used, following Edwards, de Barraud, Fauna British India, Diptera,  
vol. 5, p. 442, 1884.
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_aureostriatus_ var. _kanaranus_ (Barraud)

_Finlaya greeni_ (Theo.) var. _kanaranus_ Barraud, 1924. Indian Journ. Med. Res., vol. 11, p. 850 (male, female). **Type:** Female (holotype), in British Museum according to Barraud (1934) but it has not been located there. **Type locality:** India: Karwar, northern Kanara (Barraud). **Habitat:** Tree holes and bamboos. **Remarks:** Larva not specifically described.

_Aedes_ (Finlaya) _greeni_ (Theobald) var. _kanaranus_ Barraud, 1934. Fauna British India, Diptera, vol. 5, p. 185. Emendation.

_burgosi_ Baisas


_candidoscutellum_ Marks

_Queensland, New South Wales; New Guines

_Aedes_ (Finlaya) _candidoscutellum_ Marks, 1947. Univ. Queensland Pap., Dept. Biol., vol. 2, pt. 6, p. 1 (male, female, pupa, larva). **Type:** Female (holotype) in University of Queensland.* **Type locality:** Australia: Binna Burra, Lamington National Park, Queensland (Perkins). **Habitat:** Tree holes and a rock pool.

_chrysolineatus_ (Theobald)

_India; Siam; Malaya; Indo-China; Java; Sumatra

_Howardina chrysolineata_ Theobald, 1907. A monograph of the Culicidae or mosquitoes, vol. 4, p. 218 (female). **Type:** Female (holotype) in British Museum.* **Type locality:** Ceylon: Pundabroya (Pundaluoya) (Green). **Habitat:** Tree holes, rock holes in stream beds, bamboos, _Colocasia_, and occasionally artificial containers.

_Hulecoetemia trilineata_ Leicester, 1904 (nec Theobald, 1901). In Theobald, Entomologist, vol. 27, p. 163 (male, female). **Type:** Male, female (cotypes) in British Museum.* **Type locality:** Malaya: Kuala Lumpur (Leicester).
hegneri Causey

_Aedes (Finlaya) hegneri_ Causey, 1937. Journ. Parasitol., vol. 23, p. 548 (male, female). _Type_: Male (holotype), stated as being in U. S. N. M. but has not been deposited there. _Type locality_: Siam: Chang (Causey). _Habitats_: Rock pools. _Remarks_: Larva undescribed.

macdougalli Edwards


macfarlanei (Edwards)


mallochi Taylor

_Queensland; New South Wales_ Aedes (Finlaya) _mallochi_ Taylor, 1944. Proc. Linn. Soc. New South Wales, vol. 69, p. 121 (female). Male undescribed. _Type_: Female (neotype) in School of Public Health and Tropical Medicine, University of Sydney.* _Type locality_: Australia: Eidsvold (Brancroft). _Habitat_: Tree hole. _Remarks_: Larva undescribed. No types were designated by Taylor. Therefore, a female specimen from the type location has been designated neotype at this time.

mediovittatus (Coquillet)

_Antilles; Virgin Islands; Venezuela_ Stegomyia _mediovittata_ Coquillet, 1906. Can. Ent., vol. 38, p. 60 (male, female). _Type_: Male, female (cotypes) in U.S.N.M.* _Type locality_: West Indies: San Domingo (Busck). _Habitat_: Tree holes and artificial containers. _Remarks_: Larva described by Dyar, Mosquitoes of America, p. 227, 1928.


notoscriptus (Skuse)

types) in Macleay Museum, University of Sydney. **Type locality:** Australia: Sydney, New South Wales (Masters and Skuse). **Habitat:** Tree holes, rock pools, fallen palm fronds, and artificial containers. **Remarks:** Larva described by Lee, An atlas to the mosquito larvae of the Australasian region, p. 57, 1944.

*nootscriptus var. montanus* Brug

* Ajed (Finlaya) nootscriptus (Skuse) var. montana* Brug, 1939. *Tijdschr. Ent.,* vol. 82, p. 104 (male). Female not described. **Type:** Male (holotype) in British Museum.* **Type locality:** Java: Lembang, 1,250 meters (Brug). **Habitat:** Tree hole. **Remarks:** Larva not described.

*pseudotaeniatus* (Giles) 

*Culex pseudotaeniatus* Giles, 1901. *Journ. Bombay Nat. Hist. Soc.,* vol. 13, p. 607 (sexes not stated). **Type:** Male, female (cotypes) in British Museum.* **Type locality:** India: Naini Tal, 7,000 feet (Giles). **Habitat:** Tree holes, rock pools, and artificial containers.

*quinquelineatus* Edwards

*Aedes (Finlaya) quinquelineatus* Edwards, 1922. *Bull. Ent. Res.,* vol. 13, p. 93 (female). Male unknown. **Type:** Female (holotype) in British Museum.* **Type locality:** Queensland (Bancroft). **Habitat:** Tree holes, rock pools, and artificial containers.

*shortti* (Barraud) 

*Finlaya shortti* Barraud, 1923. *Bull. Ent. Res.,* vol. 13, p. 405 (male, female). **Type:** Male, female (cotypes) in British Museum.* **Type locality:** Assam: Shillong, Khasi Hills (Barraud). **Habitat:** Rock pools.

**Group F (ALBOANNULATUS-group: DANIELSIA)**

*alboannulatus* (Macquart)

*Culex albo-annulatus* Macquart, 1849. *Diptères exotiques nouveaux ou peu connus, Suppl. 4,* p. 10 (female); *Mémoires,* p. 312, 1850. Male described by Theobald, A monograph of the Culicidae or mosquitoes, vol. 1, p. 391, 1901. **Type:** Location unknown. **Type locality:** Australia. **Habitat:** Ground and rock pools, occasionally in brackish marshes. **Remarks:** Larva described by Lee, Atlas of mosquito larvae of the Australasian region, p. 60, 1944.
albocinctus (Barraud) Yunnan; Western Himalayas


albotaeniatus (Leicester) India; Malaya; Sumatra


albotaeniatus var. mikiranus Edwards Yunnan; India; Assam


alektorovi Stackelberg Siberia


alticola Bonne-Wepster New Guinea


anggiensis Bonne-Wepster New Guinea


argenteeiris Brug New Guinea

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auridorsum Edwards

Queensland


auronitens Edwards

Western Himalayas


australiensis (Theobald)

Queensland


biocellatus (Taylor)

New South Wales; Queensland


christophersi Edwards

Kashmir; Himalayas


clintoni Taylor

New Guinea

derooki Brug

dobodurus King and Hoogstraal

fengi Edwards

fluviatilis (Lutz)


Danielseia mediomaculata Theobald, 1907. A monograph of the Culicidae or mosquitoes, vol. 4, p. 245 (male, female). Type: f in British museum. Type locality: South America: Paré, Brazil (Goeldi).


gilli (Barraud)
MOSQUITOES OF THE SUBGENUS FINLAYA—KNIGHT AND MARKS 563

British Museum.* **TYPE LOCALITY**: India: Krol Mountain, near Solan (Kalka-Simla road), 7,000 feet (Barraud). **HABITAT**: Tree holes.

harperi Knight  

hollandius King and Hoogstraal  

knabi (Coquillett)  

lephana (Barraud)  

mackerrasii Taylor  

monocellatus Marks  
novalbitarsis King and Hoogstraal

_Aedes_ (Finkaya) *novalbitarsis* King and Hoogstraal, 1946.


*Leucomyia albitarsis* Taylor, 1914 (nec _albitarsis_ Ludlow, 1905).

Trans. Ent. Soc. London 1914, p. 194 (female). **Type:** Female (holotype) in School of Public Health and Tropical Medicine, University of Sydney. **Type Locality:** New Guinea: Lakekamu Gold Field (Giblin).

occidentalis (Skuse)

*Oulex occidentalis* Skuse, 1889. Proc. Linn. Soc. New South Wales, vol. 3, p. 1729 (female). Male not specifically described. **Type:** Female (holotype) in Macleay Museum, University of Sydney.* **Type Locality:** Australia: King Georges Sound, western Australia (Masters). **Habitat:** Ground and rock pools, brackish marshes, fallen palm fronds, concrete well, and holes in fallen logs. **Remarks:** Larva described by Lee, Atlas of the mosquito larvae of the Australasian region, p. 60, 1944.

_Culicada campstoni_ Taylor, 1914. Trans. Ent. Soc. London 1913, p. 692 (female). **Type:** Female (holotype) in School of Public Health and Tropical Medicine, University of Sydney.* **Type Locality:** Australia: Melbourne, Victoria (Campston).

_Culicada demansis_ Strickland, 1911. Entomologist, vol. 44, p. 202 (female). **Type:** Female (holotype) in British Museum.* **Type Locality:** Tasmania (Bancroft).

_Culicada hybrida_ Taylor, 1916. Proc. Linn. Soc. New South Wales, vol. 41, p. 568 (female). **Type:** Female (holotype) in School of Public Health and Tropical Medicine, University of Sydney.* **Type Locality:** Australia: Milson Island, New South Wales (Cleland).

_Culicella queenslandis_ Strickland, 1911. Entomologist, vol. 44, p. 179 (female). **Type:** Female (holotype) in British Museum.* **Type Locality:** Australia: Queensland (Bancroft).

_Culicella similis_ Strickland, 1911. Entomologist, vol. 44, p. 132 (female). **Type:** Female (holotype) in British Museum.* **Type Locality:** Australia: Mount Lofty, southern Australia (Cleland).

occidentalis var. milsoni (Taylor)

New South Wales; Queensland

_Culicada milsoni_ Taylor, 1915. Proc. Linn. Soc. New South Wales, vol. 40, p. 179 (male, female). **Type:** Female (holo-
MOSQUITOES OF THE SUBGENUS FINLAYA—KNIGHT AND MARKS 565

type) in School of Public Health and Tropical Medicine, University of Sydney.* Location of male unknown. **TYPE LOCALITY:** Australia: Milson Island, New South Wales (Ferguson). **HABITAT:** Ground and rock pools. Occasionally in brackish marshes. **REMARKS:** Larva described by Lee, Atlas of the mosquito larvae of the Australasian region, p. 60, 1944.


**palmarum** Edwards Queensland


**papuensis** (Taylor) New Guinea; Solomon Islands

*Leucoomyia australiensis*, Theobald var. *papuensis* Taylor, 1914. Trans. Ent. Soc. London 1913, p. 193 (female). **TYPE:** Female (holotype) in School of Public Health and Tropical Medicine, University of Sydney.* **TYPE LOCALITY:** New Guinea: Milne Bay, Papua (Breinl). **HABITAT:** Tree holes, ground pools, rock pools, and artificial containers.

**purpureus** (Theobald) Queensland; western Australia; Northern Territory


*Aedes (Finlaya) priestleyi hamadryadis* Cooling, 1924. Comm. Australian Dept. Health Serv. Publ. 8, p. 24 (male, female). **TYPE:** A male collected by Cooling exists in the collection of the School of Public Health and Tropical Medicine, University of Sydney,* which probably could be considered the type for this name. **TYPE LOCALITY:** Australia: Derby, western Australia (Cooling).

Calomyia priestleyi Taylor, 1914. Trans. Ent. Soc. London, 1913, p. 684 (female). Type: Female (holotype) in School of Public Health and Tropical Medicine, University of Sydney.* Type locality: Australia: Townsville, Queensland (Priestley).

similensis Edwards


stevensoni (Barraud)


subalbitarsis King and Hoogstraal


subsimilis (Barraud)


toxopeus Bonne-Wepster

MOSQUITOES OF THE SUBGENUS FINLAYA—KNIGHT AND MARKS

zoosophas Dyar and Knab


**Group II (GENICULATUS-group; PROTOMACLEAYA)**

albolateralis (Theobald)

India; Assam; Yunnan; Malay; Philippines

Stegomyia albolateralis Theobald, 1908. Rec. Indian Mus., vol. 2, p. 289 (females). **Type**: Female (holotype) in collection of Zoological Survey of India, Calcutta. **Type Locality**: Assam: Sylhet (Hall) and Lungleh, Lushai Hills. **Habitat**: Tree holes and bamboos.

alboniveus Barraud

Aedes (Finlaya) alboniveus Barraud, 1934. Fauna of British India, Diptera, vol. 5, p. 210 (male, female, larva). **Type**: Male (holotype) in British Museum.* **Type Locality**: India: Kurseong, Darjeeling district, eastern Himalayas (Barraud). **Habitat**: Tree holes and bamboos.

dissimilis (Leicester)

Yunnan; Malay; India


**dissimilis var. karwari (Barraud)**

India

dorseyi Knight


eatoni (Edwards)


echinus (Edwards)


genicularis (Olivier)


_Euoclorus equinus_ Meigen, 1804. *Classification und Beschreibung der Europäischen zweiflügeligen Insecten (Diptera)*, vol. 1, p. 3. **Type**: Unknown. **Type locality**: ? **Remarks**: We have not seen this reference.


_Culex albo-punctatus_ Rondani, 1872. *Bull. Soc. Ent. Ital.*, vol. 4, p. 31 (male). **Type**: Unknown. **Type locality**: ?
idjenensis Brug
**Type**: One female (cotype) in Institut voor Tropische Hygiene, Amsterdam. **Type Locality**: Malaya: Eastern part of the Archipelago. **Habitat**: ? **Remarks**: Larva not known.

lacteus Knight

laoagensis Knight

leucocelaenus Dyar and Shannon

leucomeres (Giles)

leucopleurus Rozeboom
leucothaenius Komp


luzonensis Rozeboom


niveoides Barraud

_Aedes (Finlaya) niveoides_ Barraud, 1934. Fauna of British India, Diptera, vol. 5, p. 211 (male, ?larva). Female unknown. _Type_: Male (holotype) in British Museum.* _Type locality_: India: Nagargali, Bombay, Deccan (Barraud). _Habitat_: Tree holes and bamboo.

niveus (Ludlow)


_Stegomyia pseudonivea_ Theobald, 1910. A monograph of the Culicidae or Mosquitoes, vol. 5, p. 176 (male). _Type_: Male (lectotype) in British Museum.* _Type locality_: Andaman Islands (Lowis).

niveus nipponicus LaCasse and Yamaguti

_Aedes (Finlaya) niveus nipponicus_ LaCasse and Yamaguti, 1948. Mosquito fauna of Japan and Korea, pt. 2, p. 79 (male, female, larva). _Type_: Location unknown. _Type locality_: Japan: Kyushu and Honshu. _Habitat_: Bamboo. Occasionally in stone vases and bowls.

novoniveus Barraud

_Aedes (Finlaya) novoniveus_ Barraud, 1934. Fauna of British India, Diptera, vol. 5, p. 211 (male, female, larva). _Type_: Male (holotype) in British Museum.* _Type locality_: India: Mungpoo, Darjeeling District, eastern Himalayas (Barraud). _Habitat_: Tree holes and bamboo.
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Oreophilus (Edwards) India

Paradissimilis Rozeboom Philippines

Peipingensis Feng China

Pseudoniveus (Theobald) Borneo; Malaya; Sumatra


Pulchriventer (Giles) Himalayas; Kashmir; Assam

saperoi Knight


suffusus Edwards


triseriatus (Say)


triseriatus var. hendersoni Cockerell

Western United States


yunnanensis (Gaschen)


GROUP UNDETERMINED

halongi Galliard and Ngu

Indo-China

lauriei (Carter)  
*Ochlerotatus lauriei* Carter, 1920. Proc. Zool. Soc. London, 1920, p. 623 (male, female, pupa, larva). **Type:** Male, female (co-types) in Liverpool School of Tropical Medicine.* **Type locality:** Australia: Lord Howe Island (Laurie). **Habitat:** Tree hole.  

**subauridorsum Marks**  
*Aedes (Finlaya) subauridorsum* Marks, 1948. Univ. Queensland Pap., Dept. Biol., vol. 2, No. 8, p. 28 (male, female, pupa, larva). **Type:** Female (holotype) in University of Queensland.* **Type locality:** Australia: Mount Mowbullan, Bunya Mountains, Queensland (Wassell). **Habitat:** Tree holes and stump holes.

**tonkinensis Galliard and Ngu**  
*Aedes (Finlaya) tonkinensis* Galliard and Ngu, 1947. Ann. Parasit., vol 22, p. 77 (male, ♀ female, larva). **Type:** Nonexistent. **Type locality:** Indo-China: Baie d'Along. **Habitat:** Rocky excavation.

**upatensis Anduze and Hecht**  
*Aedes (Finlaya) upatensis* Anduze and Hecht, 1943. Bol. Ent. Venezolana, vol. 2, p. 185 (male). Female unknown. **Type:** Male (holotype) in Instituto de Higiene, Caracas, Venezuela. **Type locality:** South America: Region of Upata, Distrito Piar, Estado Bolivar, Venezuela (Hecht). **Habitat:** Rock holes. **Remarks:** Larva not described.

**LITERATURE CITED**

**Barraud, P. J.**

**Dyar, H. G.**

**Edwards, F. W.**

*Following the completion of this paper, an opportunity occurred for the examination of the types of lauriei (male genitalia and larva not seen). Because of the well-defined median scutal line and the vague subdorsal line this species would normally be keyed to Group D. However, the median scutal line is broader than is usual in that group and the general adult habitus is different. On the basis of general appearance, it shows marked relationship to the species included in Subgroup VI, alboannulatus s. str. of Group F. Also, morphologically it fits into this subgroup on all characters except that the male palpi have only a few apical hairs on III–V. However, it will not key to Subgroup VI because of the unmottled femora.*
HOPKINS, G. H. E.

KING, W. V., and HOOSTRA, H.

KNIGHT, K. L.


KNIGHT, K. L., and LAFFOON, J. L.

MARKS, E. N.

NATYS, L. R.

ROZEBROOK, L. E.

STONE, A., and BORHART, R. M.

VARGAS, L.

ADDENDA

The following references came to hand too late to be considered here:


VARGAS, L. Los subgeneros de Aedes. Dounsiomysia, n. subgen. . . . Rev. Inst. Salub. Enferm. Trop., vol. 11, pp. 61–69, 1950 (divides Finlaya into three subgenera: (Finlaya, Gaulteria, and Dounsiomysia): transfers certain species to Haemagogus. We believe few of the species were studied in sufficient detail to support changes).

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