

## Review of the leafhopper genus *Makilingia* Baker (Hemiptera: Cicadellidae: Mileewinae)

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### Abstract

The taxonomy of the leafhopper genus *Makilingia* Baker is reviewed based on comparative morphological study of types and other specimens. Twenty-six species are recognized as valid including ten new species described and illustrated herein: *M. davaoensis* n. sp., *M. lobata* n. sp., *M. maculamima* n. sp., *M. nigramima* n. sp., *M. paranigra* n. sp., *M. siamensis* n. sp., *M. tenebrifrons* n. sp., *M. uncinata* n. sp., *M. viraktamathi* n. sp., and *M. xanthopicta* n. sp. *Makilingia siamensis* n. sp. represents the first known occurrence of the genus outside the Philippine Archipelago and the first record for Thailand. *Makilingia simillima* Baker, n. stat., formerly treated as a variety of *M. variabilis* Baker, is elevated to full species status based on distinctive differences in the male genitalia. Lectotypes are designated for several species described by Baker. The male genitalia of these species are described and illustrated for the first time and a key to all known species is provided.

**Key words:** Philippines, morphology, biogeography, Makilingiini

### Introduction

The Oriental leafhopper genus *Makilingia* Baker was described by Baker (1914) to include five species of peculiar leafhoppers endemic to the Philippine Archipelago. Melichar (1923) added four more species and provided a key to species. Baker (1924), unaware of Melichar's work, reviewed the genus and added 16 species and varieties, two of which Baker (1925) subsequently recognized as synonyms of his previously described species (Merino 1936).

Evans (1947) placed *Makilingia* in the monobasic tribe Makilingiini of Cicadellinae (as "Tettigellinae") based on the unique features of the head (broad gena concealing proepisternum, small lora) in his comprehensive review of the higher classification of Cicadellidae. Young (1968) elevated the tribe to status as a separate subfamily in his revision of Cicadellinae and it was treated as such until Dietrich (2011) relegated it to tribal status within an expanded concept of Mileewinae.

Young (1968) indicated his intention to treat *Makilingia* in a separate paper and studied type material for species of the genus in the U. S. National Museum (Baker collection) and Moravian Museum (Melichar collection). Unfortunately, although he left some notes and drawings at North Carolina State University (L. L. Deitz, in litt.), Young apparently never prepared a manuscript and his work on the genus was never published. Thus, *Makilingia* has never been revised adequately and, although many species have distinctive color patterns, the male genitalia, structures of crucial importance for species-level identification of leafhoppers, have never been illustrated. This paper is an attempt to provide an improved classification and key to species of the genus based on study of the male and female genitalia of available type material, supplemented by additional specimens as well as notes and drawings prepared by D. A. Young.

## Materials and methods

Morphological terminology follows Dietrich (2005). Specimens examined are deposited in the California Academy of Sciences, San Francisco (CAS), Illinois Natural History Survey, Champaign (INHS), Queen Sirikit Botanical Garden, Chiang Mai, Thailand (QSBG), Oklahoma Museum of Natural History, Norman (OMNH), Philippines National Museum, Manila (PNM), Royal Ontario Museum, Ottawa (ROM), and U. S. National Museum, Washington (USNM). Labels of type specimens are quoted with a slash separating lines on a single label and a semicolon separating text from different labels. Most species described by Baker were based on series of specimens labeled as cotypes. Comparative study of the male genitalia of these co-type series in the USNM revealed the presence of four new species superficially similar to the nominal species described by Baker. To fix the identities of Baker's species, we have designated a single male specimen from each series as the lectotype by attaching a red "LECTOTYPE" label.

More recent collecting in the Philippines yielded few specimens assignable to previously described species but, instead, produced specimens of five new species, suggesting that further collecting in previously unsampled areas of the Philippines will likely yield additional species. Also, a single series of specimens representing an additional new species (see *M. siamensis*, below) was recently collected in southern Thailand, indicating that the genus may be more widespread in Southeast Asia, although these specimens may also represent an unintentional introduction from the Philippines.

## Taxonomy

### Subfamily Mileewinae Evans 1947

### Tribe Makilingiini Evans 1947

### *Makilingia* Baker

Type species: *Makilingia nigra* Baker 1914

**Diagnosis.** Head with crown depressed, anterior margin sharply carinate and encroaching onto eye laterally; lateral frontal sutures not extended onto crown; gena broad, without distinct emargination below eye; pronotum and base of forewing distinctly punctate; front femur with seta AM1 small and inconspicuous.

**Description.** Small to medium-sized, cylindrical leafhoppers (5–10 mm). Coloration usually mostly dark brown or black with legs yellow, usually with symmetrical yellow or orange markings dorsally on head and forewing, rarely mostly pale yellow (Figs. 1, 2). Dorsum of head, pronotum and mesonotum, gena, lorum and base of forewing distinctly punctate. Head produced, ocelli on crown well separated from anterior margin and eyes, crown with anterior margin parabolic, sharply carinate with carina elevated and encroaching onto eyes laterally; posterior margin of eye not extended to posterior margin of crown medially; face convex; frontoclypeus shagreen with muscle scars visible, with or without punctations medially; lateral frontal sutures weakly divergent, extended to dorsal margin of face; clypeal suture poorly delimited or absent; anteclypeus nearly as long as frontoclypeus, weakly to strongly convex, tapered distally, apical margin extended beyond lower margin of gena; lorum small, well separated from genal margin, not extended dorsad of anteclypeus; gena broad, lateral margin convex, not emarginate below eye, completely concealing proepisternum; antennal ledge absent; antenna shorter than width of head; rostrum extended to middle coxae.

Pronotum wider than head, convex, lateral margins as long as or longer than eyes, divergent posteriorly in dorsal view, carinate, carina distinctly below posterior corner of eye. Exposed part of mesonotum and scutellum variable in size interspecifically, scutellar suture deeply impressed. Forewing with varying amounts of opaque sclerotization, venation somewhat poorly delimited, especially near base; R three branched, s crossvein absent (present in *M. pruinosa*); r-m1 present or absent; m-cu2 present; supernumerary r-m and m-cu crossveins sometimes present; CuA reaching wing margin at claval apex; inner apical cell nearly parallel-sided. Hind wing with submarginal vein usually complete, R and M separate distally. Prothoracic femur slender, AM1 small, inconspicuous; intercalary row extended from basal third to apex, with numerous setae becoming shorter and finer

distally; rows AV and PV absent; tibia cylindrical or very weakly bicarinate dorsally, dorsal rows with fine setae, row AV with several macrosetae becoming longer distally. Mesothoracic legs approximately same size as prothoracic legs, without conspicuous macrosetae. Hind femur with macrosetal formula 2+1+1, antepenultimate seta often much smaller than others; tibia slender, PD with more macrosetae than AD, intercalary setae absent; tarsomere I with pair of dorsoapical macrosetae, pecten usually with 2 platellae.

Male abdomen with 2S apodemes weakly developed. Pygofer (Fig. 3) with base usually broadly sclerotized dorsally, lobe with longitudinal row of enlarged setae near base, ventral appendage present or absent. Segment X well sclerotized dorsoapically and laterally with distinct articulation to dorsal margin of pygofer adjacent to dorsal connective. Valve large, convex, posterior margin rounded, joined basally to pygofer by narrow sclerotized ridge but with extensive membranous cleft more distad. Subgenital plates movably articulated to valve, fused to each other near base but separated and divergent for most of length, each plate broad and somewhat depressed basally, narrowing distally, with darkly pigmented dorsal denticulate callosity opposite style apex, distal lobe weakly sclerotized compressed, macrosetae absent but scattered short, stout setae present. Style apodeme elongate, straight; apophysis short with large, rounded basal lobe ventrally, apex falcate, with few widely spaced ventral preapical setae. Connective elongate, anterior arms very short and bowed laterad, strongly compressed median anterior ventral keel usually present, stem arcuate in lateral view, widened posteriorly in ventral view, articulated to aedeagus. Aedeagus short, preatrium developed, shaft weakly sclerotized posteriorly, atrium usually with prominent lateral lobes or flanges. Well-sclerotized V-shaped dorsal connective present and articulated between atrium and basal ventrolateral lobes of segment X; gonopore poorly delimited and situated in large, membranous area on posterior surface of shaft.

Female sternite VII covering base of ovipositor, sternite VIII variably sclerotized and folded dorsad of sternite VII in repose. First valvulae slender, dorsal sculpture concatenate, ventroapical sculpture irregularly granulose. Second valvulae with distal toothed blades occupying approximately two thirds total length, slightly sinuate to straight, dorsal margin arcuate with several large teeth distributed over most of blade and small serrations between teeth. Third valvulae (gonopods) with sparse small setae ventrally.

**Notes.** *Makilingia*, the only genus included in tribe Makilingiini, has an unusual combination of morphological traits that suggest mixed affinities. The structure of the head, with a moderately to strongly convex face and dorsal ocelli, and ovipositor with the toothed blades of the second valvulae occupying more than half the total length of the valvulae, clearly places it in a lineage with Cicadellinae, Mileewinae (where it is currently placed), and Signoretiinae. The presence of distinct punctations on the dorsum and somewhat enlarged pronotum of *Makilingia* suggests a relationship to Signoretiinae but, unlike members of that subfamily, the pronotum does not extend all the way to the scutellum and the hind leg chaetotaxy is not reduced. The male genitalia are similar to those of Cicadellinae and Signoretiinae (and different from Mileewini and Tinteromini) in having the subgenital plates triangular. Like other Mileewinae, *Makilingia* has the submarginal vein of the hind wing very close to the wing margin and this was the main basis for Dietrich's (2011) placement of the group as a tribe of Mileewinae. A recent phylogenomic analysis of Membracoidea (Dietrich *et al.*, 2017) did not recover Mileewinae *sensu* Dietrich (2011) as monophyletic but provided support for a relationship between Makilingiini, Tungurahualini, and Cicadellinae. Additional analyses will be needed to resolve the relationship of Makilingiini to other leafhoppers. Some undescribed leafhopper genera and species from Melanesia (New Guinea, Solomon Islands, New Caledonia) resemble *Makilingia* to various degrees, including the presence of distinct pits on the head and pronotum, basally fused male subgenital plates lacking macrosetae, and presence of a sclerotized dorsal connective articulated between the aedagal atrium and base of anal tube (Viraktamath & Webb, ms. in prep.).

Comparative study of the male genitalia of available specimens revealed considerable variation in several structures that appears to be diagnostic at the species level. The overall structure of the genital capsule is remarkably uniform but variation occurs in the degree of sclerotization of the pygofer base and the length, vestiture and orientation of the ventral pygofer appendage, which is absent in a few species. Species may be divided into two groups based on the structure of the subgenital plate. One group has the plates normally developed with the distal, unpigmented section extended posterad well beyond the basal darkly sclerotized section. The other group has the distal section strongly reduced, membranous and extended dorsad. The structure of the styles and connective are relatively constant among species with only minor variation in relative proportions and in the shape and vestiture of the style apophysis. The aedeagus is also conservative in structure, the main variation occurring in the relative lengths and orientations of the preatrium and shaft, and the shape of the lateral lobes of the atrium, which bears posteriorly directed processes in a few species.



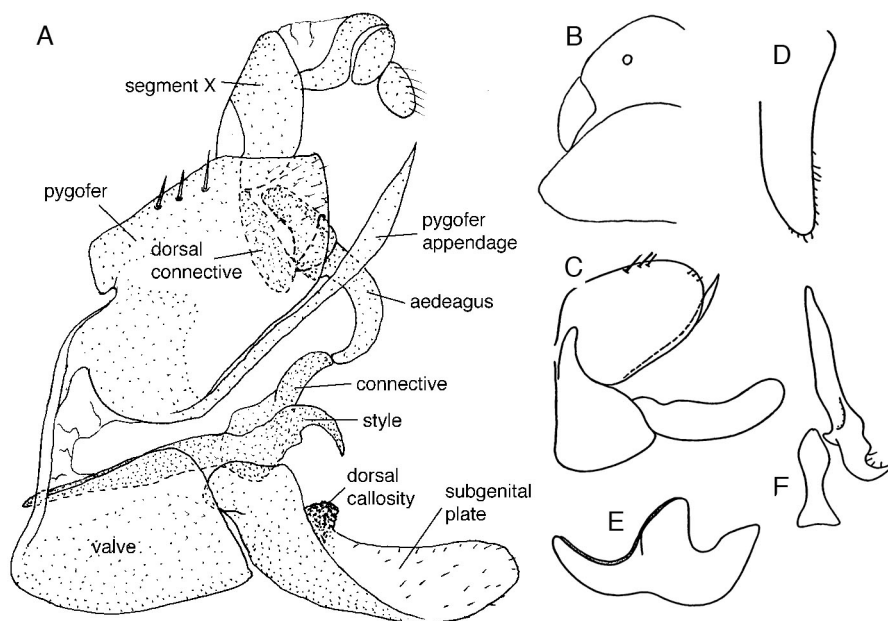
**FIGURE 1.** *Makilingia* spp., dorsal and lateral habitus: A–B, *Makilingia banahaoensis*, male; C, *M. banahaoensis*, female; D–E, *M. colorata* lectotype male; F–G, *M. costalis*, holotype male; H–I, *M. davaoensis*, holotype male; J–K, *M. flavifrons*, male; L–M, *M. frontalis*, lectotype male; N–O, *M. haightiana* lectotype male; P–Q, *M. intermedia* (lectotype male of *M. variabilis*); R–S, *M. lineata* holotype female; T–U, *M. lobata*, holotype male; V–W, *M. maculamima*, holotype male; X–Y, *M. maculata*, lectotype male; Z–AA, *M. nigra* lectotype male; BB–CC, *M. nigramima* holotype male; DD–EE, *M. pallida*, lectotype male; FF, *M. pallida* (cotype of *M. pallida benguetensis* Baker), female; GG–HH, *M. panayensis*, holotype female; II–JJ, *M. panayensis*, male; Scale bars: 1 mm.





**FIGURE 2.** *Makilingia* spp., dorsal and lateral habitus: A–B, *M. paranigra*, holotype male; C–D, *M. pruinosa*, male; E–F, *M. siamensis*, holotype male; G–H, *M. sibuyanensis* lectotype male. I–J, *M. similima*, lectotype male; K–L, *M. speciosa*, paralectotype female; M–N, *M. surigaoensis*, lectotype male; O–P, *M. suturalis*, lectotype male; Q–R, *M. tenebrifrons*, holotype male. S–T, *M. tettigonoides*, lectotype male. U–V, *M. uncinata*, holotype male; W–X, *M. viraktamathi*, holotype male; Y–Z, *M. woodworthi*, holotype male. AA–BB, *M. xanthopicta*, holotype male.

Variation also occurs in the shape and dentition of the female second valvulae, but not to the extent found in the related tribe Mileewini (Krishnankutty & Dietrich 2011, Yang *et al.* 2014).



**FIGURE 3.** A, *Makilingia xanthopicta* n. sp., male genital capsule, lateral view, with parts labeled. B–F, *Makilingia suturalis* Melichar, holotype (drawings by D. A. Young): B, head and pronotum, dorsal view, left side; C, male genital capsule, lateral view; D, left male subgenital plate, ventral view; E, aedeagus, lateral view; F, style and connective, ventral view.

#### Key to species of *Makilingia* (modified from Baker 1924)

1. Pronotum yellow, with or without small black anterior spots (Figs 2Q, R) .....27
- 1' Pronotum black, with or without pale posterior margin (Fig. 1A) .....2
2. Forewing black in basal fourth, remainder orange; body length >7.5 mm (Figs 2K, L) .....*speciosa* Baker
- 2' Forewing with bright orange pigment, if present, extended to base (Figs 1A, H); body length <7.5 mm .....3
3. Forewing coloration primarily orange or red (Figs 1D, H, DD) .....4
- 3' Forewing coloration primarily black with paler markings, if present, mostly restricted to margins and/or clavus (Figs 1J, P) .6
4. Head with median black marking not extended to anterior margin of crown (Fig. 1H) .....*davaoensis* n. sp.
- 4' Head with median black marking extended to anterior margin of crown medially (Fig. 1D); forewing red .....5
5. Crown distinctly shorter than distance between basomedial corners of eyes (Fig. 1T) .....*lobata* n. sp.
- 5' Crown as long as distance between basomedial corners of eyes (Fig. 1D) .....*colorata* Baker
6. Head black, without pale markings on crown or face (Figs 1L, M) .....7
- 6' Head with crown and/or face with white, yellow or reddish markings. ....14
7. Anteclypeus with distal margin distinctly notched .....*pruinosa* Baker
- 7' Anteclypeus with distal margin convex .....8
8. Forewing with costal margin white (Fig. 1M) .....9
- 8' Forewing with costal margin brown, concolorous with adjacent part of corium .....10
9. Frontoclypeus with areas between punctures glabrous .....*frontalis* Baker
- 9' Frontoclypeus with areas between punctures shagreen. ....*costalis* Baker
10. Forewing with transcommissural pale marking(s) (Fig. 2O) .....*suturalis* Melichar
- 10' Forewing commissure black .....11
11. Aedeagus with atrial processes curved ventrad in posterior view (Fig. 5BB) .....12
- 11' Aedeagus with atrial processes broadly rounded or curved dorsad in posterior view (Figs 5GG, 6W) .....13
12. Aedeagus with anterodorsal ridge on shaft (Fig. 6N) .....*paranigra* n. sp.
- 12' Aedeagus without anterodorsal ridge on shaft (Fig. 5CC) .....*nigra* Baker
13. Aedeagus with atrial processes slender, bulbous apically (Fig. 5II) .....*nigramima* n. sp.
- 13' Aedeagus with atrial processes broadly rounded (Fig. 6W) .....*siamensis* n. sp.
14. Crown with eye bordered anteromedially with black (Fig. 1J) .....15
- 14' Crown with one or more pale markings extended to eye margin (Fig. 1N) .....23
15. Face with frontoclypeus entirely pale (Fig. 1K) .....16

15'	Face entirely black or with only dorsal part of frontoclypeus pale (Figs 1HH, 2H).	17
16	Aedeagal shaft with pair of acute preapical lateral processes (Figs 4W, X).	<i>flavifrons</i> Melichar
16'	Aedeagal shaft without lateral preapical processes (Figs 7GG, HH)	<i>woodworthi</i> Baker
17.	Face with broad pale dorsal area, extended over most of frontoclypeus in male (Fig. 1FF)	<i>panayensis</i> Baker
17'	Face entirely black or with very narrow pale dorsal margin (Fig. 1NN)	18
18.	Crown with two pale marginal spots (Fig. 2I).	<i>similima</i> Baker
18'	Crown with four pale marginal spots (Fig. 2G)	19
19.	Clavus with only slender line along commissure yellow (Fig. 2G)	<i>sibuyanensis</i> Baker
19'	Clavus with broader transcommissural yellow markings (Fig. 1V)	20
20.	Forewing with commissural yellow marking covering most of clavus (Fig. 1V).	21
20'	Forewing with commissural yellow marking covering less than half of clavus (Fig. 1P)	22
21.	Aedeagal shaft in lateral view approximately twice as long as wide, preatrium with ventral tooth (Fig. 5S)	<i>maculamima</i> n. sp.
21'	Aedeagal shaft in lateral view distinctly less than twice as long as wide, preatrium without ventral tooth (Fig. 5X)	<i>maculata</i> Baker
22.	Aedeagus in lateral view with preatrium approximately as wide as sclerotized part of shaft, shaft in posterior view tapered from base to apex (Fig. 7LL)	<i>xanthopicta</i> n. sp.
22'	Aedeagus in lateral view with preatrium distinctly narrower than sclerotized part of shaft, shaft in posterior view broadened from base to near apex (Fig. 5I)	<i>intermedia</i> Melichar
23.	Crown with four pale or reddish marginal spots (Fig. 2S)	<i>viraktamathi</i> n. sp.
23'	Crown with two or three pale marginal spots	24
24.	Crown with three marginal reddish spots or with entire anterior margin reddish (Figs 1A, C, N).	25
24'	Crown with two marginal pale areas separated by black line at apex (Fig 1R)	26
25.	Forewing clavus with two medial red spots or red oblique band (Figs 1A, C).	<i>banahaoensis</i> Baker
25'	Forewing clavus without medial spots or band (Fig. 1N).	<i>haightiana</i> Baker
26.	Clavus orange yellow with two dark stripes; eye bordered with orange (Fig. 1R).	<i>lineata</i> Baker
26'	Clavus black with narrow yellow commissural line; eye bordered with black (Fig. 2G).	<i>surigaensis</i> Baker
27.	Face and mesosternum heavily marked with black (Figs 2R, V), aedeagus with shaft little or no longer than preatrium (Figs 7, X).	28
27'	Face and mesosternum pale (Fig 2T)	29
28.	Frontoclypeus uniformly black	<i>tenebrifrons</i> n. sp.
28'	Frontoclypeus yellow with brown transverse muscle scars	<i>uncinata</i> n. sp.
29.	Head, pronotum and mesonotum each with pair of black spots (Fig. 2S); body length >7.5 mm	<i>tettigonoides</i> Baker
29'	Head, pronotum and mesonotum without paired black spots (Fig. 1DD); body length <7.5 mm	<i>pallida</i> Baker

The following is an annotated checklist of species included in the genus with descriptions of new species and descriptions of the male genitalia of previously described species for which specimens were available.

### ***Makilingia banahaoensis* Baker**

(Figs 1A–C, 4A–E, 8A, 9A–B)

*Makilingia banahaoensis* Baker, 1924: 64, Fig. 6

*Makilingia banahaoensis* var. *montalbanensis* Baker, 1924: 64, Fig. 7

Male genitalia. Pygofer appendage in lateral view straight and slender through most of length, with somewhat broadened preapical section spanning distal margin of pygofer lobe, apex acuminate and curved slightly dorsad. Subgenital plate evenly curved dorsad in lateral view, broad and darkly pigmented distally, dorsal callosity multidentate. Style with preapical lobe short, blunt; apex strongly curved, without distinct preapical heel. Aedeagus with preatrium nearly as long as shaft; shaft in lateral view moderately broad, slightly expanded and curved dorsad distally, apex truncate; in posterior view with preatrium constricted medially, atrium triangular and moderately produced laterad, shaft constricted near base, evenly widened distally.

Female. Sternite VII approximately twice as wide as long, posterior margin with pair of short, broad obtusely angulate lobes flanking shallow obtuse median emargination. Second valvulae with dorsal margin broadly and more or less evenly arcuate with teeth relatively small and widely spaced.

Material examined. Lectotype male (here designated), *Makilingia banahaoensis* Baker. Labeled “Mt. Banahao / P.I., Baker; Cotype No. / U.S.N.M.; LECTOTYPE / *Makilingia* / *banahaoensis* Baker / des. CH Dietrich & JN Zahniser 2019; USNMMENT / 01513155”. 2 male, 3 female paralectotypes, first two labels same as lectotype, 1 female additionally labeled “20427; *Makilingia* / *banahaoensis* / Baker”; 1 female additionally labeled “JNZ\_AA0133”; each labeled “PARALECTOTYPE / *Makilingia* / *banahaoensis* Baker/ des. CH Dietrich / & JN

Zahniser 2019"; each with a USNM barcode label numbered 01513160 thru 01513164. [USNM]; lectotype male, *Makilingia banahaoensis* var. *montalbanensis* Baker (here designated), labeled "Montalban / Luzon / Baker; Cotype no. / U.S.N.M.; LECTOTYPE / *Makilingia banahaoensis* / var. *montalbanensis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNM / 01513249". 3 female paralectotypes, first 2 labels same as lectotype; 1 additionally labeled "20428"; 1 additionally labeled "JNZ\_AA0021"; each labeled "PARALECTOTYPE / *Makilingia banahaoensis* / var. *montalbanensis* Baker / des. CH Dietrich / & JN Zahniser 2019"; each with a USNM barcode label numbered 01513156 thru 01513158 (USNM). Other material: 1 male, Philippines, Luzon, Rizal, "San Andalos", December 1926, R. C. McGregor, coll. (USNM).

**Notes.** Examination of the lectotype male (here designated) of *M. banahaoensis montalbanensis* supports its synonymy with *M. banahaoensis*.

### ***Makilingia colorata* Baker**

(Figs 1D–E, 4F–J, 8B, 9C–D)

*Makilingia colorata* Baker, 1914: 413, Fig. 4

Male genitalia. Pygofer appendage slender, curved dorsad through most of length, apex extended slightly beyond pygofer lobe. Subgenital plate with sclerotized basal section short and triangular, distal unsclerotized section short and tapered, extended dorsad at right angle to basal section, dorsal callosity digitiform. Style without preapical lobe, apex widened in heel area, heel obtusely angulate. Aedeagus with preatrium as long as shaft, in lateral view posterior margin forming continuous curve with shaft; shaft short and tapered, with pair of short, preapical anterior projections; in posterior view with preatrium broadened from base to apex, atrium with pair of short lateral lobes, shaft slightly broadened distally, apex rounded and with slight median emargination.

Female. Sternite VII less than twice as wide as long, posterior margin broadly convex with narrow quadrate median emargination. Second valvulae with dorsal margin irregular, teeth very large, obliquely conical and irregularly spaced.

**Material examined.** Lectotype male (here designated), labeled "Mt. Makiling/Luzon, Baker; Cotype No./ U.S.N.M.; LECTOTYPE/ *Makilingia colorata* Baker/ C.H. Dietrich & J.N. Zahniser; USNM / 01513277". 6 male and 9 female paralectotypes, first two labels same as lectotype; each labeled "PARALECTOTYPE / *Makilingia colorata* Baker/ des. CH Dietrich / & JN Zahniser 2019"; each with a USNM barcode label numbered 01513278 thru 01513292 (USNM).

**Notes.** A male cotype from Baker's type series is here designated as lectotype to fix the identity of the species.

### ***Makilingia costalis* Baker**

(Figs 1F–G, 4K–O)

*Makilingia costalis* Baker, 1924: 69, Fig. 14

Male genitalia. Pygofer appendage slender, arcuate through most of length, apex extended slightly beyond pygofer lobe. Subgenital plate with sclerotized basal section short, distal section relatively long with unpigmented area limited to basolateral half, evenly curved in lateral view, dorsal callosity bilobed. Style with preapical lobe rectangular, apex evenly curved and tapered, without preapical heel. Aedeagus with preatrium slightly shorter than shaft, narrow and strongly curved dorsad in lateral view, forming obtuse angle with shaft; shaft broadened from base to apex, without anterior projections, apex obliquely rounded; in posterior view with preatrium constricted, atrium with pair of short rounded lobes, shaft ovoid, apex rounded with slight median emargination.

**Material examined.** Holotype male labeled "Surigao/ Mindanao/ Baker; 20438; Holotype; JNZ\_AA0769; LECTOTYPE / *Makilingia costalis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNM / 01513295" (USNM).

**Notes.** This species was described based on a male specimen deposited in the USNM collection. According to information provided by Baker (1924) this species resembles *M. frontalis* in coloration but differs in its slightly larger size and the presence of shagreen texture between the punctures of the frontoclypeus. It is one of two known



species of the genus that has the dorsum of the head uniformly black and the forewing costal margin pale but without pale markings elsewhere on the wing.

***Makilingia davaoensis* n. sp.**

(Figs 1H–I, 4P–T)

**Description.** Length of male 5.7 mm, female unknown. Coloration. Head mostly pale stramineous, frontoclypeus with small dorsomedial black spot, area between frontoclypeus and eye black, gena with diffuse dark brown to black markings, crown with five-lobed median black marking covering ocelli but not extended to anterolateral margins; pronotum, mesonotum, scutellum, mesepisternum, mesepimeron and lateral part of mesocoxa black; forewing greenish ochraceous, pits in basal half black; legs yellow, front and hind tibiae tinged with orange; abdomen mostly dark brown. Structure. Head produced with crown anterior margin forming blunt 90° angle; face with frontoclypeus and anteclypeus finely shagreen, clypeal suture obsolete, anteclypeus in profile very slightly angulate; distinct punctations restricted to genae. Forewing venation obscure, without supernumerary branches or crossveins.

Male genitalia. Pygofer appendage absent. Subgenital plate very short and broad, basal sclerotized section semicircular in ventral view, distal unsclerotized section very short, extended slightly dorsad of basal section but not posterad, dorsal callosity large, digitiform. Style without preapical lobe, distal section acuminate, without preapical heel. Aedeagus in lateral view with preatrium half length of shaft and forming continuous curve with posterior margin of shaft, shaft relatively narrow, widened to midlength then tapered to apex with obtuse preapical projection on dorsal surface; in posterior view with preatrium widened from base, atrium heart shaped with prominent, denticulate dorsolateral lobes, shaft relatively narrow, widened to midlength then tapered to apex.

Female unknown.

**Etymology.** The species name refers to the type locality.

**Material examined.** Holotype male, PHILIPPINES: Lake Davao, 2° growth, screen sweep, 22 May 1987, ROM 873035, D. C. Darling (ROM).

**Notes.** This distinctively marked species resembles *M. colorata* and *M. lobata* in forewing coloration but differs in having the median black marking on the crown not extended to the lateral margin.

***Makilingia flavifrons* Melichar**

(Figs 1J–K, 4U–Y, 8C, 9E–F)

*Makilingia flavifrons* Melichar, 1923: 119

*Makilingia bimaculata* Baker 1924: 67, Fig. 12

Description from Melichar (1923; translated from the original German): Crown as long as distance between bases of eyes, anterior margin with two triangular orange-red marks not reaching eyes and with inner corners extended to ocelli, face yellow, antennae and legs yellow.

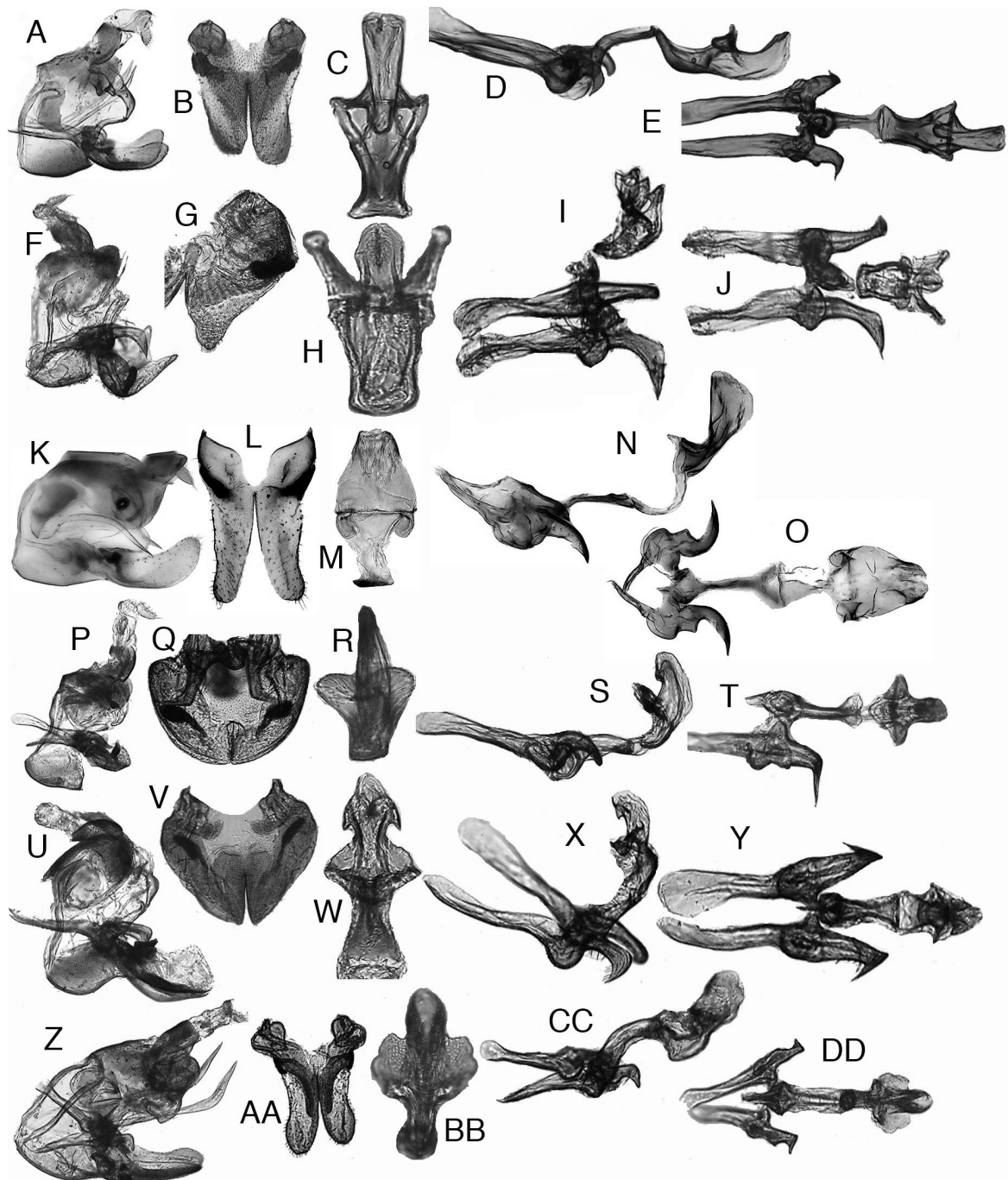
Male genitalia (based on lectotype of *M. bimaculata* Baker). Pygofer appendage short, slender, not extended beyond lobe. Subgenital plate with sclerotized basal portion broadly and evenly rounded laterally, distal unsclerotized portion very short, broad and compressed, not extended posterad, dorsal callosity prominent, bilobed. Style without preapical lobe, apex with heel area broadened and angulate. Aedeagus with preatrium as long as shaft; in lateral view with shaft posterior margin forming obtuse angle with preatrium, shaft approximately parallel-sided through most of length, curved slightly dorsad with pair of triangular preapical processes extended anterad; in posterior view with preatrium constricted medially, atrium diamond shaped without processes, shaft expanded distally with lateral preapical processes retrorse.

Female. Sternite VII less than twice as wide as long, posterior margin with trapezoidal emargination. Second valvulae relatively slender, dorsal margin nearly straight, teeth short, obliquely conical and widely spaced.

**Material examined.** Lectotype male, *M. bimaculata* Baker, here designated, labeled: "Imugin/ N. Viscaya/ Baker; Cotype No./ U.S.N.M.; LECTOTYPE / *Makilingia* / *bimaculata* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMNT / 01513159"; 11 male and 7 female paralectotypes with same first two labels as lectotype, 1

female additionally labeled “20433”, 1 female additionally labeled “30-5-73C”; 4 male and 1 female paralectotypes labeled: “Baguio/ Benguet/ Baker; Cotype No./ U.S.N.M.”; 4 male paralectotype labeled “Dapitan / Mindanao / Baker; Cotype No./ U.S.N.M.”; each paralectotype labeled “PARALECTOTYPE / *Makilingia* / *bimaculata* Baker / des. CH Dietrich / & JN Zahniser 2019”; each paralectotype with USNM barcode label numbered 01513250 thru 01513276 (USNM).

**Notes.** The lectotype of *M. flavifrons* Melichar, designated by Young & Lauterer (1966), was not examined but, according to Young's unpublished notes, he accepted Baker's (1925) synonymy of *M. bimaculata* with *M. flavifrons*, and this interpretation is followed here. A co-type from Baker's collection is here designated lectotype for *M. bimaculata* Baker to fix the identity of the taxon.



**FIGURE 4.** *Makilingia* spp. male genitalia: A–E, *M. banahaoensis*, genital capsule in lateral view, subgenital plates in ventral view, genitalia in lateral and ventral views; F–J, same, *M. colorata* (only right plate shown); K–O, same, *M. costalis*; P–T, same, *M. davaoensis*; U–Y, same, *M. flavifrons*; Z–DD, same, *M. frontalis*. Note: The genitalia of *M. colorata* are shown with the dorsal connective still attached to the aedeagal atrium.

***Makilingia frontalis* Baker**  
(Figs 1L–M, 4Z–DD, 8D, 9G–H)

*Makilingia frontalis* Baker, 1924: 69, Fig. 15

Male genitalia. Pygofer with ventral appendage elongate, narrow basally broadened and bent dorsad beyond margin of lobe, apex tapered and extended beyond lobe by more than half length of lobe. Subgenital plate relatively long, basal sclerotized section relatively short and narrow, distal lobe long and broad, curved slightly dorsad and compressed, dorsal callosity relatively small. Style with preapical lobe broad, angulate, distinctly angulate preapical heel present. Aedeagus with preatrium nearly as long as shaft, in lateral view bent at right angle, shaft compressed, broad in lateral view, apex irregularly rounded; in posterior view with preatrium narrow and slightly constricted medially, atrium with pair of large irregularly rounded lateral denticulate flanges, shaft nearly parallel-sided to rounded apex.

Female. Sternite VII nearly twice as wide as long, posterior margin with pair of narrow acute projections flanking shorter rounded medial lobe. Second valvulae with dorsal margin nearly straight through most of length, somewhat broadened near apex and obliquely truncate, teeth prominent, numerous, rounded and somewhat irregularly spaced.

**Material examined.** Lectotype male, here designated, labeled: "Davao/ Mindanao/ Baker; Cotype/ U.S.N.M.; LECTOTYPE / *Makilingia / frontalis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMENT / 01513296". 2 female paralectotypes, first two labels with same data, additionally labeled "PARALECTOTYPE / *Makilingia / frontalis* Baker / des. CH Dietrich / & JN Zahniser 2019"; each with a USNMENT barcode label numbered 01513297 thru 01513298; 1 additionally labeled "20442" (USNM).

**Notes.** A male cotype from Baker's type series in the USNM is here designated lectotype to fix the identity of the species. This species resembles *M. costalis* in having the dorsum uniformly black except for the pale costal margin of the forewing but differs in having the texture of the face between the punctures glabrous rather than shagreen.

***Makilingia hightiana* Baker**  
(Figs 1N–O, 5A–E, 8E, 9I–J)

*Makilingia hightiana* Baker, 1924: 65, Fig. 8

Male genitalia. Pygofer appendage moderately slender and short, curved slightly dorsad and extended slightly beyond apex of lobe. Subgenital plate very short and broad, basal sclerotized section evenly rounded laterally, distal unsclerotized section nearly obsolete, dorsal callosity large, prominent. Style without preapical lobe, apex evenly curved, without distinct preapical heel. Aedeagus in lateral view with preatrium shorter than shaft, posterior margin forming continuous curve, shaft tapered with anterodorsal obtuse angulate projection; in posterior view with preatrium nearly parallel-sided, atrium with pair of short triangular denticulate lateral lobes, shaft slightly tapered from base to rounded narrowly bifid apex.

Female. Sternite VII less than twice as wide as long, posterior margin with pair of broad concavities flanking sharply acute median lobe. Second valvulae with dorsal margin broadly arcuate, teeth prominent, oblique, widely spaced except near apex.

**Material examined.** Lectotype male, here designated, labeled: "Baguio/ Benguet/ Baker; Cotype/ U.S.N.M.; LECTOTYPE / *Makilingia / hightiana* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMENT / 01513300". 5 male, 3 female, and 1 of indeterminate sex (abdomen missing) paralectotypes, first two labels with same data as lectotype; additionally labeled "PARALECTOTYPE / *Makilingia / hightiana* Baker / des. CH Dietrich / & JN Zahniser 2019"; each with a USNMENT barcode label numbered 01513301 thru 01513309 (USNM).

**Notes.** A male cotype from Baker's type series in the USNM is here designated lectotype to fix the identity of the species. This species resembles *M. banahaoensis* in having three red spots on the crown margin but differs in lacking spots or bands on the clavus except around the margin and in having the distal weakly pigmented section of the male subgenital plate very short and extended dorsad.

### ***Makilingia intermedia* Melichar**

(Figs 1P–Q, 5F–J, 8F, 9K–L)

*Makilingia intermedia* Melichar, 1923: 119

*Makilingia variabilis* Baker 1924: 63, Fig. 4

*Makilingia bakeri* Melichar 1923: 119

Male genitalia (based on lectotype of *M. variabilis*). Pygofer appendage slender and elongate, slightly expanded and twisted preapically beyond pygofer lobe. Subgenital plate relatively short and broad, distal lobe robust, evenly curved dorsad; dorsal callosity large, without distinct lobes. Style with preapical lobe short and broadly angulate, preapical heel absent. Aedeagus with preatrium slightly longer than shaft, shaft in lateral view strongly tapered from base to apex, nearly straight, lateral atrial process tapered, slightly surpassing mid-width of shaft; in posterior view with preatrium constricted medially, atrium broadly triangular, shaft narrow and parallel-sided basally, expanded and bulbous in distal half, apex broadly rounded with narrow medial cleft.

Female. Sternite VII less than twice as wide as long, tapered, posterior margin with broad V-shaped emargination. Second valvulae with dorsal margin nearly straight through most of length, teeth short, bluntly conical, nearly evenly spaced.

**Material examined.** Lectotype male of *M. variabilis* Baker, here designated, labeled: "Imugin/N. Viscaya/ Baker; Cotype No./ U.S.N.M.; LECTOTYPE / *Makilingia / variabilis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513299". 9 male, 3 female, and 1 sex undetermined (abdomen missing) paralectotypes, first label same as lectotype, 4 of them with red Cotype labels. 21 male and 15 female paralectotype labeled "Baguio/ Benguet/ Baker", 2 with red Cotype labels. 21 male paralectotypes labeled "Dapitan/ Mindanao/ Baker". All paralectotypes labeled "PARALECTOTYPE / *Makilingia / variabilis* Baker / des. CH Dietrich / & JN Zahniser 2019"; each with a USNMMENT barcode label numbered 01513310 thru 01513317, 0151322 thru 01513383 (USNM). Other material. 1 female, Philippines: Prov. Nueva Vizcaya, Quezon Munc. Mount Palali Basecamp, Waypoint 126, 16.45977°N, 121.22388°E, 816m, 4.vi.2017 Berlese, Siler Brachymeles Expedition 4 (OMNH); 1 male, same data except Streamside, 16.46198°N, 121.21970°E, 696m, 3.vi.2017, Yellow+Blue pan traps (OMNH).

**Notes.** Baker (1925) proposed the above synonymies and was followed by Merino (1936) but it is doubtful that either of them studied Melichar's type material. Young and Lauterer (1966) listed *M. intermedia* but not *M. bakeri* among the types present in the Moravian Museum collection although they mentioned that there were three additional specimens of *M. intermedia* from "Bubalan; Luzon", type locality of both *M. intermedia* and *M. bakeri*. Treatment of *bakeri* as a junior synonym of *intermedia* follows Baker (1925) although he treated the former as a variety of the latter.

Melichar's (1923) description of *M. bakeri* is as follows (translated from the German): Crown as long as distance between bases of eyes, apex with 4 square yellow-white spots, the front ones small, lateral ones somewhat larger. Dorsum and venter black, forewing commissure with hyaline white marking and spot at apex, inner apical cell of corium hyaline white. Antennae and legs pale yellow.

### ***Makilingia lineata* Baker**

(Figs 1R–S, 8G, 9M–N)

*Makilingia lineata* Baker, 1924: 65, Fig. 9

Male. Unknown.

Female. Sternite VII less than twice as wide as long, posterior margin with narrow M-shaped emargination. Second valvulae with dorsal margin evenly arcuate through most of length, teeth more prominent and long near middle than at base and apex.

**Notes.** This species was described based on a single female specimen deposited in the USNM collection. The type specimen has been crushed dorsoventrally and is in poor condition and no other specimens matching Baker's description and illustrations were located. The species may be distinguished from other members of the genus by the narrow black median triangular marking on the crown.

**Material examined.** Female holotype labeled "Imugin/ N. Viscaya/ Baker; 20430; *Makilingia / lineata* / Baker [red label]; JNZ\_AA0031; USNMMENT / 01513319" (USNM).



***Makilingia lobata* n. sp.**

(Figs 1T–U, 5K–O)

**Description.** Length of male 5.6 mm, female unknown. Coloration. Head with face pale stramineous except muscle scars near dorsum of frontoclypeus brown and vertical band between frontoclypeus and eye extended across lorum to ventral margin black; crown reddish orange laterally with five-lobed medial black marking, anterior and lateral lobes extended to anterolateral margin; pronotum, mesonotum, scutellum, mesepisternum, mesepimeron and lateral part of metacoxa black; legs yellow, tibiae tinged with orange; forewing greenish ochraceous, pits in basal half black; abdomen mostly dark brown. Structure. Head weakly produced with crown anterior margin broadly parabolic; face with frontoclypeus and anteclypeus finely shagreen, clypeal suture obsolete, anteclypeus in profile very slightly angulate; distinct punctations restricted to genae. Forewing venation relatively well delimited, without supernumerary branches or crossveins, s crossvein absent.

Male genitalia. Tergite VIII with pair of lateral anteriorly directed angulate lobes. Pygofer appendage very slender, evenly curved dorsad, extended slightly beyond lobe. Subgenital plate with distal section unpigmented, curved strongly dorsad with apex curved laterad; dorsal callosity digitiform. Style without preapical lobe, apophysis unusually elongate and evenly curved. Aedeagus in lateral view with preatrium as long as shaft, strongly curved, atrium with paired compressed flanges extended posterad to mid-width of shaft, shaft tapered with median anterior preapical tooth; in posterior view with preatrium rectangular, atrium broadened dorsad with two pairs of short processes, shaft tapered to narrowly rounded apex.

Female unknown.

**Material examined.** Holotype male, PHILIPPINES: Mindanao, Bukidnon, Mt. Kitanglad summit trail, 8°9.91'N 124°55.96'E, 1773m, 3 April 2012, T.A. Catanach, TAC 2012044; 2 male paratypes, PHILIPPINES: Mindanao, Bukidnon, Mt. Kitanglad summit trail 8°9.63'N, 124°55.90'E, 1885m, 1 April 2012, T.A. Catanach, TAC 2012035; 1 male, PHILIPPINES: Mindanao, Bukidnon, Mt. Kitanglad, Entavas, August 2011, A. Mohagan (INHS).

**Etymology.** The species name refers to the lobed dark medial marking of the crown.

**Notes.** This species resembles *M. davaoensis* in coloration but differs in having the lateral lobes of the median black marking on the crown extended to the lateral margin, the distal unpigmented section of the male subgenital plate well developed and the aedeagus with two pairs of acute atrial processes.

***Makilingia maculamima* n. sp.**

(Figs 1V–W, 5P–T)

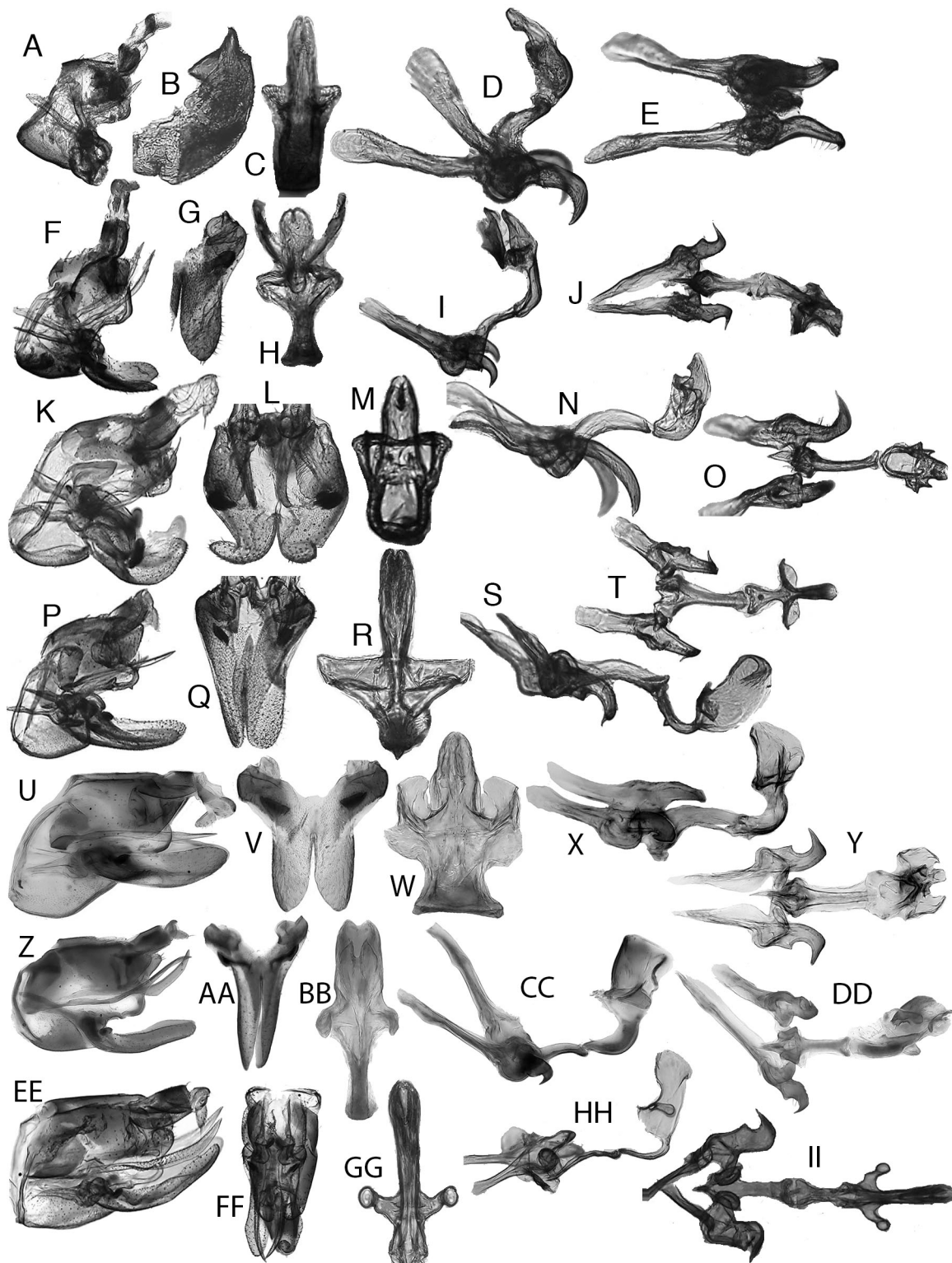
Length of male 5.2–5.4 mm. Coloration. Black overall; crown with two pairs of orange marginal spots, forewing clavus with large bright yellow transcommissural marking constricted near middle, corium black with small semicircular clear area near apex of costal margin; legs yellow. Structure. Head strongly produced with crown anterior margin parabolic; face with frontoclypeus and anteclypeus shagreen, distinct pits restricted to gena, clypeal suture weakly delimited. Forewing venation poorly delimited, without supernumerary branches or crossveins.

Male genitalia. Pygofer appendage moderately broad, nearly straight, extended well beyond apex of lobe. Subgenital plate relatively long and robust, slightly but evenly curved dorsad, distal lobe darkly pigmented ventromedially, unpigmented dorsolaterally, dorsal callosity small. Style with preapical lobe forming right angle, apex avicephaliform. Aedeagus in lateral view with preatrium shorter than shaft, very narrow and strongly curved, with triangular posterior tooth near midlength; shaft broad, compressed, robust with anteroapical ridge hoodlike; in posterior view with preatrium broad basally, narrowed distad, atrium triangular with pair of depressed lateral flanges, shaft narrow basally, broadened distally to rounded narrowly emarginate apex.

**Etymology.** The species name refers to the similarity of this species to *M. maculata*.

**Material examined.** Holotype male from Baker collection labeled "Surigao/ Mindanao/ Baker; USNM / 01513419" (USNM).

**Notes.** This species closely resembles *M. maculata* in size and color pattern but differs in having the head more strongly produced and in the structure of the male genitalia.



**FIGURE 5.** *Makilingia* spp. male genitalia: A–E, *M. haightiana*, genital capsule in lateral view, subgenital plates in ventral view (only right plate shown), genitalia in lateral and ventral views; F–J, same, *M. intermedia* (only right plate shown); K–O, same, *M. lobata*; P–T, same, *M. maculamima*; U–Y, same, *M. maculata*; Z–DD, same, *M. nigra*; EE–II, same, *M. nigramima*. Note: The genitalia of *M. intermedia* are shown with the dorsal connective still attached to the aedeagal atrium.

### ***Makilingia maculata* Baker**

(Figs 1X–Y, 5U–Y, 8H, 9O–P)

*Makilingia maculata*, 1914: 412, Fig. 3

Male genitalia. Pygofer appendage moderately broad, nearly straight, extended well beyond apex of lobe. Subgenital plate moderately long and robust, slightly but evenly curved dorsad, distal lobe lightly pigmented ventromedially, darkly pigmented dorsolaterally, dorsal callosity small. Style with preapical lobe forming right angle, apex footlike with angulate preapical heel. Aedeagus in lateral view with preatrium nearly as long as shaft, moderately broad and strongly curved; shaft broad, robust with weak anteroapical ridge; in posterior view with preatrium broad constricted medially, atrium with pair of large weakly bilobed lateral flanges, shaft broad basally, tapered distally to rounded apex.

Female. Sternite VII less than twice as wide as long, tapered, posterior margin with pair of narrow lateral lobes flanking broader, shorter medial lobe. Second valvula with dorsal margin biarcuate, teeth numerous, short, blunt.

**Material examined.** Lectotype male of *M. maculata* Baker, here designated, labeled: “Mt. Banahao / P.I., Baker; Cotype No. / U.S.N.M.; LECTOTYPE / *Makilingia / maculata* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513397”. 1 male paralectotype, first two labels same as lectotype, also labeled “*Makilingia / maculata* / Baker; PARALECTOTYPE / *Makilingia / maculata* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT 01513399”. 1 female paralectotype, labeled “Mt. Makiling / Luzon, Baker; Cotype No. / U.S.N.M.; PARALECTOTYPE / *Makilingia / maculata* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT 01513398”. Other material. One male from Baker collection labeled “Malinao/ Tayabas/ Baker”; one female labeled “Surigao/ Mindanao/ Baker” (USNM).

**Notes.** This species resembles *M. intermedia* in coloration but differs in having the pale markings of the clavus more extensive and the processes of the aedeagal atrium greatly enlarged.

### ***Makilingia nigra* Baker**

(Figs 1X–Y, 5Z–DD, 8I, 9Q–R)

*Makilingia nigra* Baker, 1914: 411, Fig. 1

Male genitalia. Pygofer appendage large, extended well beyond apex of lobe, distal portion expanded preapically and footlike with angulate ventral preapical heel. Subgenital plate with distal lobe relatively long and slender, slightly curved dorsad, in ventral view strongly tapered, dorsal callosity relatively small. Style basal lobe large and rounded, preapical lobe rectangular, apex short and strongly curved without preapical heel. Aedeagus with preatrium nearly as long as shaft, moderately broad in lateral view, evenly curved dorsad; shaft in lateral view rectangular, broad, with weak anterior apical arcuate rim and pair of curved posterior vertical ridges, atrium with lateral processes lobelike; in posterior view shaft relatively broad and very slightly tapered to emarginate apex, atrial processes curved ventrad, preatrium slightly constricted medially.

Female. Sternite VII less than twice as wide as long, posterior margin with trapezoid-shaped lobe; sternite VIII partially sclerotized with anterior median lobe extended anterad of sternite VII. Second valvula with dorsal margin broadly biarcuate, dorsal teeth moderately prominent and more closely set near base and apex.

**Material examined.** Lectotype male, here designated, *Makilingia nigra* Baker. Labeled “Mt. Banahao / P.I., Baker; Cotype No. / U.S.N.M.; LECTOTYPE / *Makilingia nigra* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513321”. 2 male and 1 female paralectotypes labeled same as lectotype, with paralectotype designation labels and USNMMENT barcode labels numbered 01513320, 01513293, and 01513294. 1 female paralectotype with handwritten labels “Bho; *Makilingia nigra* Baker [old red label]” with paralectotype designation label and “USNMMENT / 01513318”. Male from Baker collection labeled: “Surigao/ Mindanao/ Baker”; female labeled “Mt. Makiling/ Luzon, Baker” (USNM). Other material: 1 male, 1 female, 1 sex indet. (abdomen missing) labeled “No. 383- [E, G, and B, respectively] PI / Loc Gbtn., Albay / Date 22-XII-1950 / Coll. A.E. Bigornia”, with USNMMENT barcode labels numbered 01513436 thru -438 (USNM).

**Notes.** The abbreviation “Gbtn.” likely refers to the municipality of Guinobatan in the province of Albay.

***Makilingia nigramima* n. sp.**

(Figs. 1Z–AA, 5EE–II)

Length of male 5.9 mm. Coloration. Black, unmarked except antennae and legs pale stramineous. Structure. Head produced with crown anterior margin broadly parabolic; face with frontoclypeus and anteclypeus finely shagreen and finely punctate, clypeal suture obsolete, anteclypeus in profile very slightly angulate; large punctations restricted to genae. Forewing venation relatively well delimited, without supernumerary branches or crossveins; s crossvein absent.

Male genitalia. Pygofer appendage large, straight and relatively narrow in basal half, expanded and curved dorsad in distal half, coarsely denticulate. Subgenital plate with distal lobe relatively long, evenly curved dorsad, in ventral view broadened preapically, dorsal callosity relatively small. Style basal lobe large and rounded, preapical lobe sharply angulate, apex relatively broad, with preapical heel weakly developed. Aedeagus with preatrium well developed but much shorter than shaft, weakly sclerotized dorsally such that only narrow well-sclerotized ventral section is well visible in lateral view; shaft strongly compressed, in lateral view broad, nearly straight, apex truncate, dorsal margin with medial concavity, atrium with narrow bulblike lateral process extended posterad; in posterior view, shaft slightly expanded toward apex, apex rounded, atrial process broad basally, then narrowed to bulbous apex.

Female unknown.

**Etymology.** The species name refers to the similarity of this species to *M. nigra*.

**Material examined.** Holotype male from Baker collection labeled: "Mt. Makiling/ Luzon, Baker; USNMMENT / 01513420" (USNM).

**Notes.** The holotype is part of a series of specimens identified by Baker as *M. nigra*. This is one of four known species in the genus that have the dorsum uniformly black, without red, yellow or white markings. It differs from *M. nigra*, *M. paranigra* n. sp. and *M. siamensis* n. sp. in having the lateral processes of the aedeagal atrium slender with bulblike apices.

***Makilingia pallida* Baker**

(Figs 1BB–DD, 6A–E, 8J, 9S–T)

*Makilingia pallida* Baker, 1914: 414, Fig. 5

*Makilingia pallida* var. *benguetensis* Baker, 1924: 68, n. syn.

Male genitalia. Pygofer without ventral appendage. Subgenital plate relatively long, evenly curved dorsad in lateral view, distal unsclerotized section long and broad, compressed, dorsal callosity prominent, bilobed. Style without preapical lobe, apex weakly curved and elongate. Aedeagus in lateral view with preatrium shorter than shaft, evenly curved, shaft nearly parallel-sided and slightly curved anterodorsad; in posterior view with preatrium narrow, parallel-sided, atrium with lateral lobes broadly rounded, shaft constricted near midlength, apex rounded with slight medial notch.

Female. Sternite VII nearly twice as wide as long, posterior margin with M-shaped medial emargination with middle lobe of M short and slightly bilobed. Second valvulae with dorsal margin broadly arcuate, teeth prominent and numerous, more closely set distally.

**Material examined.** Lectotype male, here designated, labeled "Mt. Makiling/ Luzon, Baker; Cotype / U.S.N.M.; *Makilingia* / *pallida* / Baker; LECTOTYPE / *Makilingia pallida* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513165". 18 male and 21 female paralectotypes, labeled same as lectotype, but with paralectotype identification labels, with USNMMENT labels numbered 01513166 thru 01513204, and 01513385. Lectotype male, here designated, labeled "Baguio / Benguet / Baker; Cotype / U.S.N.M.; LECTOTYPE / *Makilingia pallida* var. / *benguetensis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513384". 2 female paralectotypes, first two labels same as lectotype, 1 additionally labeled "*Makilingia* / *pallida* / var. *benguetensis* / Baker; USNMMENT / 01513401", 1 additionally labeled "JNZ\_AA0041; USNMMENT / 01513400", both with paralectotype identification labels. Other material. 1 male labeled "Mt. Banahao/ P. I. Baker" (USNM).

**Notes.** This species, *M. tettigonoides*, *M. tenebrifrons* and *M. uncinata* are pale yellow overall without extensive dark markings but *M. pallida* is much smaller and lacks dark spots on the head and mesonotum. The



variety *benguensis* was described by Baker for a series of specimens from Baguio, Benguet, and distinguished from the nominotypical form based on the presence of an arcuate smoky band extended from the apex of the clavus to the costal margin. Comparison of the male genitalia to those of the nominotypical form indicate that the variety is a color variant and should be considered a synonym.

***Makilingia panayensis* Baker**

(Figs 1EE–HH, 6F–J, 8K, 9U–V)

*Makilingia panayensis* Baker, 1924: 66, Fig. 11

Male genitalia. Pygofer appendage relatively slender and short, curved dorsad, extended to but not beyond apex of lobe. Subgenital plate relatively long and narrow, evenly curved dorsad, distal section mostly unpigmented except narrow dark band along ventromedial and apical margin, dorsal callosity digitiform. Style without preapical lobe, preapical heel small but distinctly angulate. Aedeagus in lateral view with preatrium nearly as long as shaft, evenly curved, shaft expanded distally, anterior margin straight, posterior margin broadly rounded, atrial processes extended horizontally nearly to posterior margin of shaft; in ventral view with preatrium constricted medially, atrium broadly triangular, lateral flanges depressed, shaft slightly tapered distally with paired narrow lateral flanges extended along basal 2/3, apex rounded and shallowly bifid. Female abdominal sternite VII with pair of short rounded lateral lobes and slightly longer acute median process.

Female. Sternite VII twice as wide as long, posterior margin truncate with pair of short V-shaped notches laterad of median triangular projection. Second valvulae with dorsal margin evenly arcuate through most of length, teeth more prominent and long near middle than at base and apex.

**Material examined.** Holotype female labeled “N.W. / Panay / Baker; 20440; HOLOTYPE / probably / (over) / the only det. / specmn. in / Baker’s coll’n / D.A.Y.; *Makilingia / panayensis* / Baker; JNZ AA\_0051; USNM / 01513402” (USNM); Other material. 3 males and 2 females, PHILIPPINES: Negros Occidental, Murcia, Mt. Canlaon 500–700m, 1–3 August 2010, A. Mohagan (INHS).

**Notes.** This species was described based on a single female specimen. Recent collecting on Mindanao yielded males and females conspecific with Baker’s holotype. The coloration of the face is sexually dimorphic, with the male having white pigmentation extended well ventrad of the antennal ledges on the frontoclypeus and the female with white pigment restricted to the area above the antennal ledges.

***Makilingia paranigra* n. sp.**

(Figs 2A–B, 6K–O, 8L, 9W–X)

**Description.** Length of male 5.5 mm, female 6.0 mm. Coloration. Black, unmarked except antennae and legs pale stramineous. Structure. Head produced with crown anterior margin broadly parabolic; face with frontoclypeus and anteclypeus finely shagreen and finely punctate, clypeal suture obsolete, anteclypeus in profile very slightly angulate; large punctations restricted to genae. Forewing venation relatively well delimited, without supernumerary branches or crossveins; s crossvein absent.

Male genitalia. Pygofer appendage robust, straight in basal half, curved slightly dorsad distally, broadened then tapered preapically, extended beyond lobe by ca. 1/4 total length. Subgenital plate relatively elongate and narrow, nearly straight in lateral view, lateral margins distinctly constricted near midlength in ventral view distal compressed section with extensive brown pigmentation, dorsal callosity with slender posteromedial extension. Style with preapical lobe sharply angulate, preapical heel distinct but small. Aedeagus in lateral view with preatrium narrow, nearly straight basally then bent dorsad near atrium, atrial flanges depressed and curved dorsad, shaft compressed and strongly expanded distally, with arcuate anteroapical hoodlike ridge; in posterior view with preatrium strongly tapered toward atrium, atrium triangular with flanges tapered, shaft parallel-sided with apex shallowly bifid.

Female. Sternite VII less than twice as wide as long, posterior margin with pair of prominent submedial lobes separated by V-shaped emargination. Second valvulae with dorsal margin arcuate at base of blade, nearly straight distally, teeth prominent, rounded, becoming smaller and more close-set distally.

**Etymology.** The species name alludes to the overall similarity of this species to *M. nigra*.

**Material examined.** Holotype male, PHILIPPINES: Negros Occidental, Murcia, Mt. Canlaon 500–700m, 1–3 August 2010, A. Mohagan; 1 male and 1 female paratype, same data (INHS).

Notes. This species differs from other species having the dorsum uniformly black in having the lateral processes of the aedeagal atrium lamelliform.

### ***Makilingia pruinosa* Baker**

(Figs 2C–D, 6P–T, 8M, 9Y–Z)

*Makilingia pruinosa* Baker, 1914: 412, Fig. 2

Male genitalia. Pygofer appendage very long and slender, nearly straight, section extended beyond pygofer lobe nearly as long as lobe. Subgenital plate with basal section bearing large, rounded lateral flange; distal lobe compressed and tapered, relatively short and weakly pigmented; dorsal callosity large, rounded. Style without preapical lobe, preapical heel present. Aedeagus in lateral view with preatrium well developed, nearly as long as shaft, curved dorsad; shaft irregularly rugose and somewhat amorphous, in lateral view relatively narrow and nearly straight with apex slightly bent anterodorsad; in posterior view, preatrium parallel-sided, shaft broadly triangular, constricted near base, tapered distally with pair of rounded lateral lobes.

Female. Sternite VII less than twice as wide as long; posterior margin with narrow concavity near middle. Second valvulae with dorsal margin triarcuate with broad basal and distal arcs separated by short medial arc, teeth prominent, oblique, becoming more close-set distally.

**Material examined.** Lectotype male, here designated, labeled “Mt. Makiling / Luzon, Baker; Cotype No. / U.S.N.M.; LECTOTYPE / *Makilingia* / *pruinosa* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513405”. One paralectotype male with first two labels same as lectotype, additionally labeled with paralectotype identification label and “*Makilingia* / *pruinosa* / Baker; USNMMENT / 01513406”. Other material. 1 male labeled “Imugin/ N. Viscaya/ Baker”; 3 males, 5 female labeled “Baguio/ Benguet/ Baker”; 3 males, 1 female labeled “Dapitan/ Mindanao/ Baker”; 1 male labeled “Mt. Makiling / Luzon, Baker”; 2 females labeled “Mt. Banahao / P.I., Baker”; other material with USNMMENT barcode labels numbered 01513421–435 (USNM).

**Notes.** This species is unique in having the apex of the anteclypeus emarginate. A male cotype from Baker's original type series is here designated as lectotype to fix the identity of the species.

### ***Makilingia siamensis* n. sp.**

(Figs 2E–F, 6U–Y)

**Description.** Length of male 5.9 mm. Coloration. Black, unmarked except antennae and legs pale stramineous. Structure. Head produced with crown anterior margin broadly parabolic; face with frontoclypeus and anteclypeus finely shagreen and finely punctate, clypeal suture obsolete, anteclypeus in profile very slightly angulate; large punctations restricted to genae. Forewing venation relatively well delimited, without supernumerary branches or crossveins.

Male genitalia. Pygofer with ventral appendage slender with sharp, triangular ventral projection adjacent to margin of pygofer lobe, distal section extended well beyond lobe. Subgenital plate relatively long and broad, ventral margin angulately curved dorsad near base, distal section with extensive brown pigmentation, dorsal callosity bilobed. Style with preapical lobe rectangular, preapical heel very weakly developed. Aedeagus in lateral view with preatrium curved dorsad, shaft posterior margin forming right angle with preatrium, roundly expanded posteriorly, approximately as broad as long; in posterior view with atrial lobes short and evenly rounded, shaft tapered to bluntly rounded apex.

Female unknown.

**Etymology.** The species name refers to the type locality, Thailand (formerly Siam).

**Material examined.** Holotype male, THAILAND: Nakhon Si Thammarat, Namtok Yong NP, behind campground lavatory, 8°10.434'N 99°44.508'E 80m, 5–6 November 2008, U-prai K. pan trap, T3551 (QSBG); 2 male paratypes, same data (INHS).

**Notes.** The type series of this species represents the first record of the genus from Thailand as well as the first record from outside of the Philippine Archipelago. It is similar to *M. nigra* and *M. paranigra* in coloration and size but easily distinguishable by the male genitalia.

***Makilingia sibuyanensis* Baker**

(Figs 2G–H, 6Z–DD, 8N, 9AA–BB)

*Makilingia sibuyanensis* Baker, 1924: 62, Fig. 3

Male genitalia. Pygofer appendage slightly sinuate and nearly parallel sided through most of length, extended well beyond lobe. Subgenital plate relatively long, evenly curved dorsad, distal section weakly pigmented medially, dorsal callosity relatively short and tall. Style with preapical lobe obtusely angulate, apex robust and distinctly rugose, without preapical heel. Aedeagus in lateral view with preatrium bent at right angle near midlength; shaft robust, tapered and strongly curved anterodorsad; in posterior view with preatrium evenly broadened from base, atrial processes broad and short, shaft relatively slender and evenly tapered with slight apical notch.

Female. Sternite VII approximately twice as wide as long, posterior margin convex with deep M-shaped median emargination. Second valvulae with dorsal margin somewhat irregularly arcuate, teeth numerous, close set, and prominent, nearly subequal in size.

Material examined. Lectotype male, here designated, labeled “Island / Sibuyan / Baker; 20439; Cotype No. / U.S.N.M.; JNZ\_AA0061; LECTOTYPE / *Makilingia / sibuyanensis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513403”. Paralectotype female, first two labels same as lectotype, additionally labeled “JNZ\_AA0143; PARALECTOTYPE / *Makilingia / sibuyanensis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513404”. (USNM).

Notes. This species was described based on one male and one female specimen deposited in the USNM collection. A male cotype is here designated as lectotype to fix the identity of the species. This species resembles *M. intermedia* but differs in having only a narrow yellow longitudinal stripe along the forewing commissure rather than a pair of large transcommissural yellow spots.

***Makilingia simillima* Baker, n. stat.**

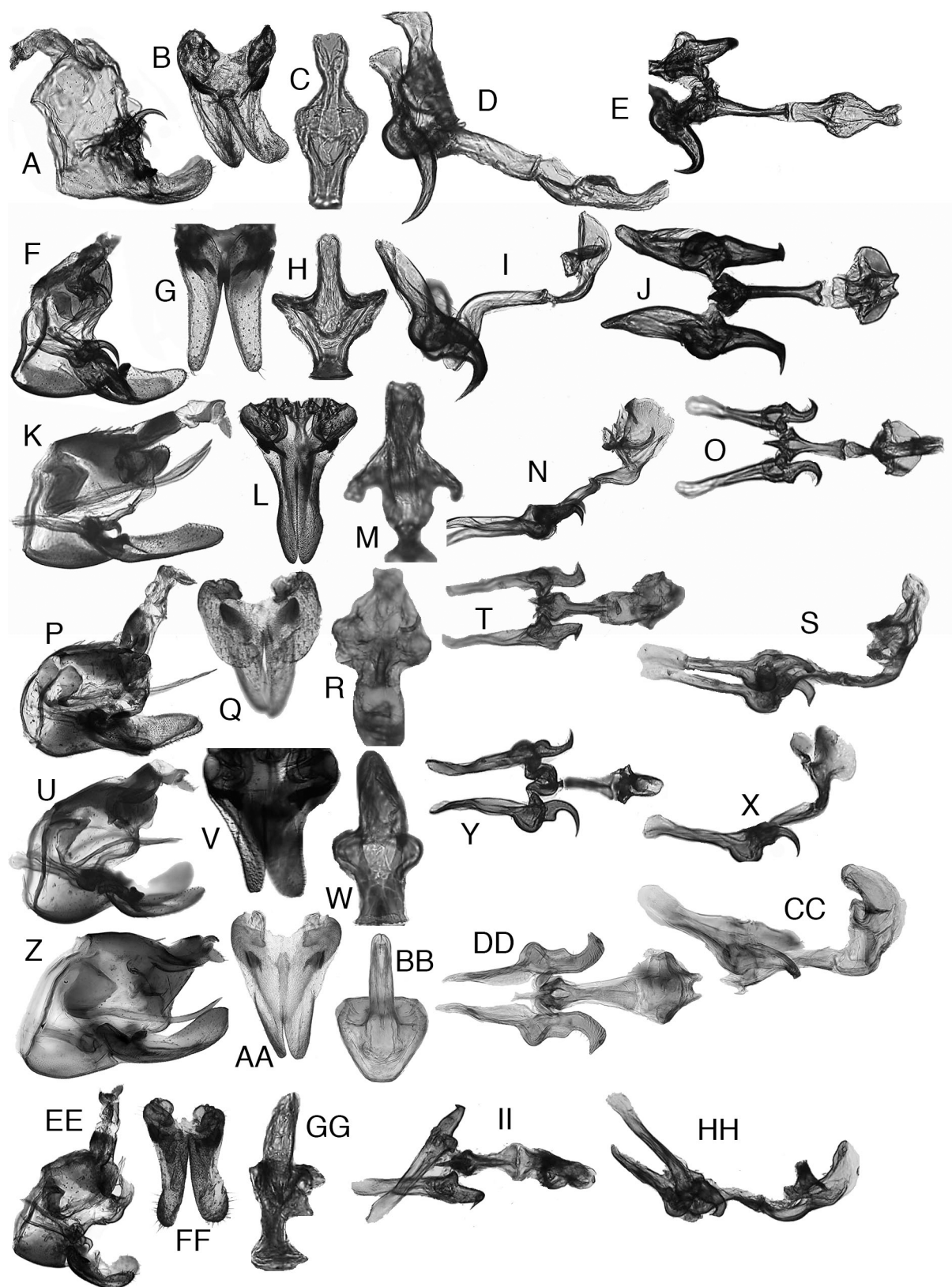
(Figs 2I–J, 6EE–II, 8O, 9CC–DD)

*Makilingia variabilis* var. *simillima* Baker 1924: 63, Fig. 5

Male genitalia (based on cotype of *M. variabilis* var. *simillima* Baker). Pygofer appendage narrow basally, gradually broadened then parallel-sided in lateral view, slightly but evenly curved dorsad through most of length, apex tapered and extended slightly beyond pygofer lobe. Subgenital plate relatively long, distal lobe robust, curved dorsad and darkly pigmented medially and laterally; dorsal callosity large, without distinct lobes. Style with preapical lobe and preapical heel poorly developed. Aedeagus in lateral view with preatrium nearly as long as shaft, evenly curved dorsad, shaft in lateral view forming obtuse angle with preatrium, slightly but evenly curved dorsad, parallel-sided through most of length but tapered to blunt apex, lateral atrial process slender and hooklike, not surpassing mid-width of shaft; in posterior view with shaft moderately broad and slightly tapered to rounded apex, atrial process arcuate.

Female. Sternite VII slightly more than half as long as wide; posterior margin with pair of broad lobes separated by relatively deep concavity. Second valvulae broadly arcuate dorsally with few widely spaced, very short, oblique teeth, distal fourth without distinct teeth.

**Material examined.** Lectotype male, here designated, of *M. variabilis* var. *simillima* Baker labeled “Baguio/ Benguet/ Baker; LECTOTYPE / *Makilingia variabilis* / var. *simillima* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT 01513396”; 5 male and 4 female paralectotypes with same locality label as lectotype and paralectotype identification labels; 1 paralectotype female labeled “Dapitan/ Mindanao/ Baker” and with paralectotype identification label; paralectotypes with USNMMENT barcode labels numbered 01513386 thru 01513395 (USNM).



**FIGURE 6.** *Makilingia* spp. male genitalia: A–E, *M. pallida*, genital capsule in lateral view, subgenital plates in ventral view, genitalia in lateral and ventral views; F–J, same, *M. panayensis*;; K–O, same, *M. paranigra*; P–T, same, *M. pruinosa*; U–Y, same, *M. siamensis*; Z–DD, same, *M. sibuyanensis*; EE–II, same, *M. similima*. Note: The genitalia of *M. siamensis* are shown in lateral view with the dorsal connective still attached to the aedeagal atrium.



**Notes.** This taxon was first described by Baker as a variety of *M. variabilis* Baker but distinctive differences in the male genitalia of the nominotypical variety (subspecies) warrant elevation of *M. simillima* to status as a separate, valid species. A cotype from Baker's type series is here designated as lectotype to fix the identity of the species.

### ***Makilingia speciosa* Baker**

(Figs 2K–L, 7A–E, 8P, 9EE–FF)

*Makilingia speciosa* Baker, 1924: 61, Fig. 2

Male genitalia. Pygofer ventral appendage evenly curved dorsad, with preapical doromedial spine, extended slightly beyond lobe. Subgenital plate with distal section curved dorsad at right angle to basal section, partly sclerotized and robust; dorsal callosity relatively small. Style with preapical lobe broad, rounded, preapical heel absent. Aedeagus in lateral view with preatrium shorter than shaft, evenly curved; shaft robust, irregularly curved dorsad, somewhat expanded preapically; in posterior view with preatrium constricted medially, atrium short and wide with lateral lobes rounded, shaft oblong ovoid, apex entire.

Female. Sternite VII slightly wider than long, posterior margin broadly and shallowly concave and darkly pigmented medially. Second valvula with dorsal margin broadly convex teeth short, blunt, and evenly spaced through most of length.

**Material examined.** Lectotype male, here designated, labeled "Baguio/ Benguet/ Baker; Cotype No./ U.S.N.M; LECTOTYPE / *Makilingia / speciosa* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT 01513410". 1 male and 2 female paralectotypes, same data, with USNMMENT barcode labels numbered 01513407 thru 01513409 (USNM).

**Notes.** A lectotype is designated from Baker's cotype series to fix the identity of the species. This is the largest known species of the genus and is readily distinguishable by the broad transverse orange band near the base of the forewing.

### ***Makilingia surigaoensis* Baker**

(Figs 2M–N, 7F–J)

*Makilingia surigaoensis* Baker, 1924: 66, Fig. 10

Male genitalia. Pygofer ventral appendage absent. Subgenital plate curved evenly dorsad, distal section weakly pigmented dorsolaterally; dorsal callosity relatively large and oblique. Style with preapical lobe very small, preapical heel absent. Aedeagus in lateral view with preatrium slightly shorter than shaft, evenly curved dorsad; shaft robust, curved dorsad, with weak lateral anterodorsally at apex; in posterior view with preatrium broader than shaft and nearly quadrate, shaft slightly constricted at base, atrial processes very short and broad.

Female unknown.

**Material examined.** Lectotype male (here designated), labeled "Surigao / Mindanao / Baker; Cotype No. / U.S.N.M; 20441; LECTOTYPE / *Makilingia / surigaoensis* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513411". 2 male and 1 female paralectotypes with first two labels same as lectotype, all with paralectotype identification labels, 1 male additionally labeled "JNZ\_AA0071; USNMMENT / 01513413", 1 male additionally labeled "*Makilingia / surigaoensis* / Baker; USNMMENT / 01513414", 1 female additionally labeled "30-5-73 F; USNMMENT / 01513412" (USNM).

**Notes.** This species was described based on an unknown number of male and female specimens deposited in the USNM collection. A male cotype is here designated as lectotype to fix the identity of the species. Our concept of the species is based on information provided by Baker (1924). This species resembles *M. lineata* in the coloration of the head but differs in having the wedge-shaped black marking on the crown broader and the forewing clavus mostly black.

### ***Makilingia suturalis* Melichar**

(Figs 2O–P, 3B–F)

*Makilingia suturalis* Melichar, 1923: 120

Melichar's description (translated from the original German): Crown black, without pale markings; forewing black with narrow elongated oval gray-yellow apical spot extended from scutellum to claval apex, narrowing to yellow line in middle, sometimes divided into two spots. Underside black, antennae and legs pale yellow. Scutellum small, broader than long, apex not swollen behind suture. 5–5.5 mm

Male genitalia. Pygofer appendage curved slightly dorsad, slightly broadened preapically, extended slightly beyond lobe. Subgenital plate in lateral view evenly curved dorsad, distal section long and robust. Style with preapical lobe obtuse, heel absent. Aedeagus in lateral view with preatrium as long as shaft, evenly curved dorsad, shaft forming obtuse angle with preatrium, broader than preatrium, curved dorsad, apex obliquely truncate, preatrium expanded anterodorsad.

**Note.** Our interpretation of this species is based on unpublished notes and drawings by D.A. Young, who examined Melichar's type in the Moravian Museum and prepared drawings of the male genitalia (Fig. 3). It is the only known species that lacks pale markings on the head and forewing costal margin but has the forewing commissure pale. In the structure of the male genitalia, this species is most similar to *M. similima* and *M. viraktamathi* but the latter are distinctly different in coloration.

### ***Makilingia tenebrifrons* n. sp.**

(Figs 2Q–R, 7K–O, 8Q, 9GG–HH)

**Description.** Length of male 6.4–7.0mm; female 7.0–8.1mm. Coloration. Golden yellow overall. Crown with pair of anterior triangular black maculae, pair of median maculae extended from eyes mesad to cover ocelli; face sexually dimorphic, males with frontoclypeus black except for small yellow median dorsal spot, females with central part of frontoclypeus yellow and with longitudinal black band next to laterofrontal suture, anteclypeus black. Pronotum with pair of anterolateral black maculae, mesonotal triangles black; thoracic pleurites black. Structure. Head relatively short with anterior margin of crown in dorsal view evenly rounded; face with frontoclypeus and anteclypeus shagreen, clypeal suture poorly delimited, anteclypeus in profile obtusely angulate; distinct punctations restricted to genae. Forewing venation moderately well delimited, without supernumerary branches or crossveins. Male genitalia. Pygofer appendage slender, evenly curved dorsad, extended well beyond lobe apex. Subgenital plate moderately long, evenly curved dorsad, basal section broad and darkly sclerotized, distal section slender with dark pigment in distal half, dorsal callosity long and moderately produced dorsad. Style without preapical lobe, apex footlike with distinctly acute heel and moderately long slender toe. Aedeagus in lateral view with preatrium as long as shaft, strongly curved, atrial processes oblique, shaft beanlike, without conspicuous teeth or ridges; in posterior view fleur-de-lis shaped with preatrium constricted medially, atrial processes broad and arcuate, shaft elliptical with narrow apical median cleft.

**Etymology.** The species name combines the Latin "tenebricus" (dark) with "frons" and refers to the mostly black face.

**Material examined.** Holotype male labeled "Imugin / N. Viscaya/ Baker; Cotype No./ U.S.N.M.; HOLOTYPE / *Makilingia tenebrifrons* / Dietrich & Zahniser / 2019; USNMENT / 01513247". Paratypes: 2 males, 4 females, same data; 2 males, 5 females labeled "Baguio / Benguet / Baker; Cotype No / U.S.N.M. All paratypes with identification label and USNMENT barcode label numbered 01513205, -209, -211, -215, -220, -221, -222, -226, -228, -230, -237, -238, -246, and -248.

**Notes.** This species closely resembles *M. tettigonoides* and the type specimens were included by Baker in his type series for the latter species. However, *M. tenebrifrons* is easily distinguishable by the distinct coloration of the head and by the male genitalia.

### ***Makilingia tettigonoides* Baker**

(Figs 2S–T, 7P–T, 8R, 9II–JJ)

*Makilingia tettigonoides* Baker, 1924: 60, Fig. 1

Male genitalia. Pygofer appendage slender, nearly straight, extended only slightly beyond pygofer lobe, slightly sinuate near base and apex. Subgenital plate very short and broad, basal section very broad and well sclerotized, distal lobes very short, narrow and weakly sclerotized, dorsal callosity long and narrow, transverse. Style without preapical lobe, preapical heel well developed, apex with distinct transverse rugae. Aedeagus with preatrium very short, in lateral view with shaft relatively long and slender, tapered, slightly curved through most of length then more sharply curved anterodorsad distally, atrial processes extended dorsad; in posterior view with atrium narrowly triangular, shaft constricted near base, bulbous distally, apex rounded with shallow median emargination.

Female. Sternite VII approximately half as long as broad; posterior margin truncate with very slight median lobe. Second valvula blade broadly biarcuate dorsally, teeth short, conical and widely spaced basally, more closely set distally.

**Material examined.** Lectotype male, here designated, labeled "Baguio/ Benguet/ Baker; Cotype No/ U.S.N.M.; LECTOTYPE / *Makilingia / tettigonoides* Baker / des. CH Dietrich / & JN Zahniser 2019; USNMMENT / 01513415". 4 male and 8 female paralectotypes, same data; 1 male paralectotype labeled "Imugin / N. Viscaya / Baker; Cotype No./ U.S.N.M."; 4 male and 6 female paralectotypes, labeled "Dapitan / Mindanao / Baker; Cotype No. / U.S.N.M."; all labeled with paralectotype identification labels and with USNMMENT barcode labels numbered 01513206 thru 208, -210, -216 thru -219, -224, -225, -227, -229, -231 thru -233, -235, -236, -239, -241, -242 thru -244, and -416 (USNM).

**Notes.** This species is readily recognized by its relatively large size and mostly yellow coloration. A lectotype from Baker's cotype series is here designated to fix the identity of the species.

### ***Makilingia uncinata* n. sp.**

(Figs 2U–V, 7U–Y, 8S, 9KK–LL)

**Description.** Length of male 7.3–8.1mm; female 7.5–7.8mm. Coloration. Golden yellow overall. Crown mostly black with pair of sinuate lateral yellow marks anteromesad of eyes, smaller spots more anteromesad, and posterior margin narrowly yellow; face sexually dimorphic, male with frontoclypeus predominantly black to dark brown fading to light brown ventrally, female with frontoclypeus black laterally and with muscle scars highlighted with black and with mostly yellow median area, anteclypeus in males brownish-yellow dorsally, with or without brown or black maculae laterally or medially, yellow ventrally, anteclypeus in females yellow. Pronotum with pair of anterolateral black maculae, mesonotal triangles black; thoracic pleurites black. Structure. Head relatively short with anterior margin of crown in dorsal view obtusely angulate; face with frontoclypeus and anteclypeus shagreen, clypeal suture poorly delimited, anteclypeus in profile obtusely angulate; distinct punctations restricted to genae. Forewing venation moderately well delimited, with few supernumerary R branches along costal margin. Male genitalia. Pygofer appendage moderately long and slender, sinuate distally, extended slightly beyond lobe. Subgenital plate moderately long, ventral margin strongly bent, distal section longer than basal section but weakly sclerotized, curved laterad and tapered to pointed apex; dorsal callosity long but not strongly produced dorsad. Style with preapical lobe very small but distinctly angulate, preapical heel distinctly angulate, apex relatively short. Aedeagus in lateral view with preatrium shorter and narrower than shaft, evenly curved; atrium well developed, lobelike, shaft short and tapered with prominent anterodorsal teeth; in posterior view with preatrium broad and constricted medially, atrial processes auriculate and curved dorsad, shaft broad, subrectangular with slender apical median notch.

**Etymology.** The species name is derived from the Latin word "uncinus" (hook, barb) refers to the toothed aedeagus.

**Material examined.** Holotype male, labeled "Baguio/ Benguet/ Baker; Cotype No./ U.S.N.M.; HOLOTYPE / *Makilingia uncinata* / Dietrich & Zahniser / 2019; USNMMENT / 01513212". Paratypes: 1 male, 2 females, same data as holotype; 2 males labeled "Dapitan / Mindanao / Baker; Cotype No./ U.S.N.M.". All paratypes with identification labels and with USNMMENT barcode labels numbered 01513213, -214, -234, -240, and -245.

**Notes.** This species resembles *M. tettigonoides* and *M. tenebrifrons* in size, structure and coloration but may be distinguished by the brown muscle scars of the frontoclypeus, the mostly black crown and the distinctive male genitalia.

***Makilingia viraktamathi* n. sp.**

(Figs 2W–X, 7Z–DD, 8T, 9MM–NN)

**Description.** Length of male 5.2 mm, female 6.0 mm. Coloration. Black overall. Dorsal margin of frontoclypeus, adjacent area between frontoclypeus and eye above antenna and four spots on crown anterolateral margin orange, posterolateral crown spots large and contacting eyes, anterior pair of spots small, forewing clavus irregularly bordered with orange, some individuals with additional oblique orange spots in clavus; legs pale yellow to white. Structure. Head produced with crown anterior margin parabolic; face with frontoclypeus and anteclypeus finely shagreen, clypeal suture obsolete, anteclypeus in profile very slightly angulate; distinct punctations restricted to genae. Forewing venation relatively well delimited, without supernumerary branches or crossveins.

Male genitalia. Pygofer appendage moderately long and slender, slightly curved dorsad, extended slightly beyond lobe. Subgenital plate moderately long and broad, ventral margin evenly curved, distal section with extensive brown pigmentation; dorsal callosity bilobed. Style with preapical lobe small, acute, preapical heel weakly developed. Aedeagus in lateral view with preatrium nearly as long as shaft, evenly curved, atrium forming anterior shelf with deep median dorsal concavity, shaft expanded distally, curved slightly anterodorsad, apex tapered; in posterior view with preatrium nearly rectangular, only slightly constricted medially, atrium only slightly broadened, shaft relatively narrow, nearly parallel-sided, with pair of short preapical lateral teeth, apex rounded and weakly bifid.

Female. Sternite VII approximately half as long as broad; posterior margin concavely emarginate near middle. Second valvulae broadly arcuate dorsally, teeth short, oblique, approximately evenly spaced through most of length.

**Etymology.** The species is named in honor of Prof. Chandra A. Viraktamath, who has made immeasurable contributions to knowledge of leafhopper taxonomy.

**Material examined.** Holotype male, PHILIPPINES: Luzon, Quezon, Mt. Banashaw de Lucban, 6.4km WSW Lucban, 1852m, 14°04.566'N 121°30.815'E 19–22 May 2011 H. Wood, N. Chonson Polydouri, C. Griswold, V. Knutson, CAS044873; 11 male and 2 female paratypes, same data (CAS).

**Notes.** This species resembles *M. banahaoensis* in coloration but has the orange band along the claval suture incomplete and the aedeagus with a pair of short preapical lateral lobes.

***Makilingia woodworthi* Baker**

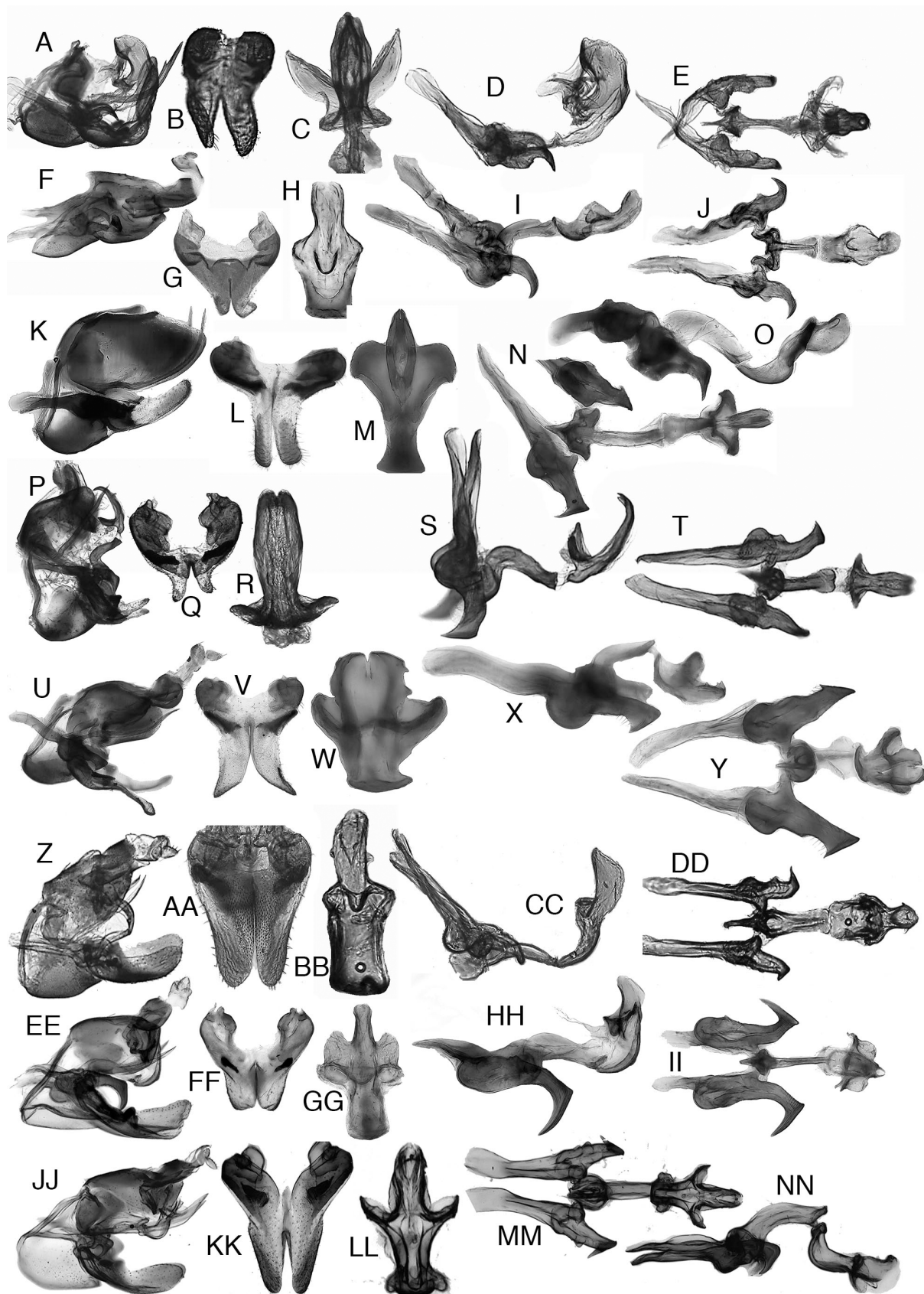
(Figs 2Y–Z, 7EE–II)

*Makilingia woodworthi* Baker, 1924: 68, Fig. 13

Male genitalia. Pygofer appendage gradually tapered and evenly curved dorsad from base to apex, extended beyond lobe. Subgenital plate moderately long, curved gradually and slightly dorsad, distal section less darkly pigmented than basal section, dorsal callosity short and relatively tall. Style without preapical lobe, apex enlarged with prominent preapical heel, distal section relatively long, with several transverse rugae. Aedeagus in lateral view with preatrium as long as shaft, sclerotized part narrow and evenly curved dorsad; shaft moderately broad, curved slightly anterodorsad, apex bluntly rounded; in posterior view with preatrium slightly constricted, atrial processes broad and weakly bilobed.

Female unknown.

**Material examined.** Holotype male, labeled “20426; Mt. Makiling / Luzon, Baker; Holotype / over / only spcmn. / in Baker / coll’n D.A.Y.; *Makilingia* / *woodworthi* / Baker; JNZ\_AA0091; USNMMENT / 01513417”. Other material. 1 male, labeled “Mt. Makiling / Luzon, Baker; St. 3-1862C / USNM; *Makilingia* / *woodworthi* / Baker / Det. J.N. Zahniser 2018; USNMMENT / 01513418” (USNM).



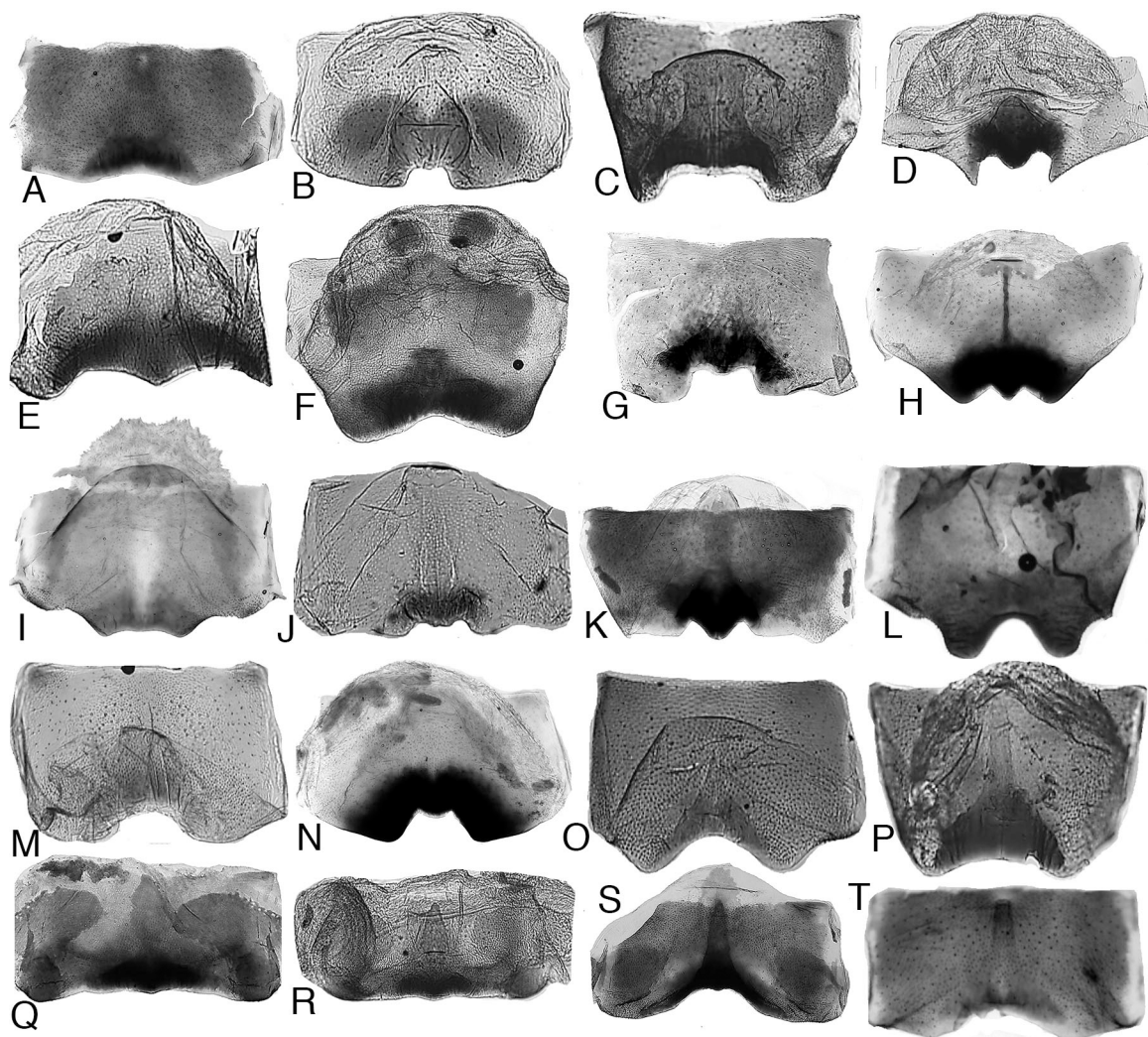
**FIGURE 7.** *Makilingia* spp. male genitalia: A–E, *M. speciosa*, genital capsule in lateral view, subgenital plates in ventral view, genitalia in lateral and ventral views; F–J, same, *M. surigaoensis*; K–O, same, *M. tettigonoides*; P–T, same, *M. viraktamathi*; U–Y, same, *M. woodworthi*; Z–DD, *M. xanthopicta*. Note: The genitalia of *M. speciosa* are shown with the dorsal connective still attached to the aedeagal atrium.

**Notes.** This species is very similar to *M. flavifrons* in the color pattern of the head but the anterior margin of the head is more broadly rounded, the black markings of the crown are narrower and the margin of the gena is pale orange rather than black.

***Makilingia xanthopicta* n. sp.**

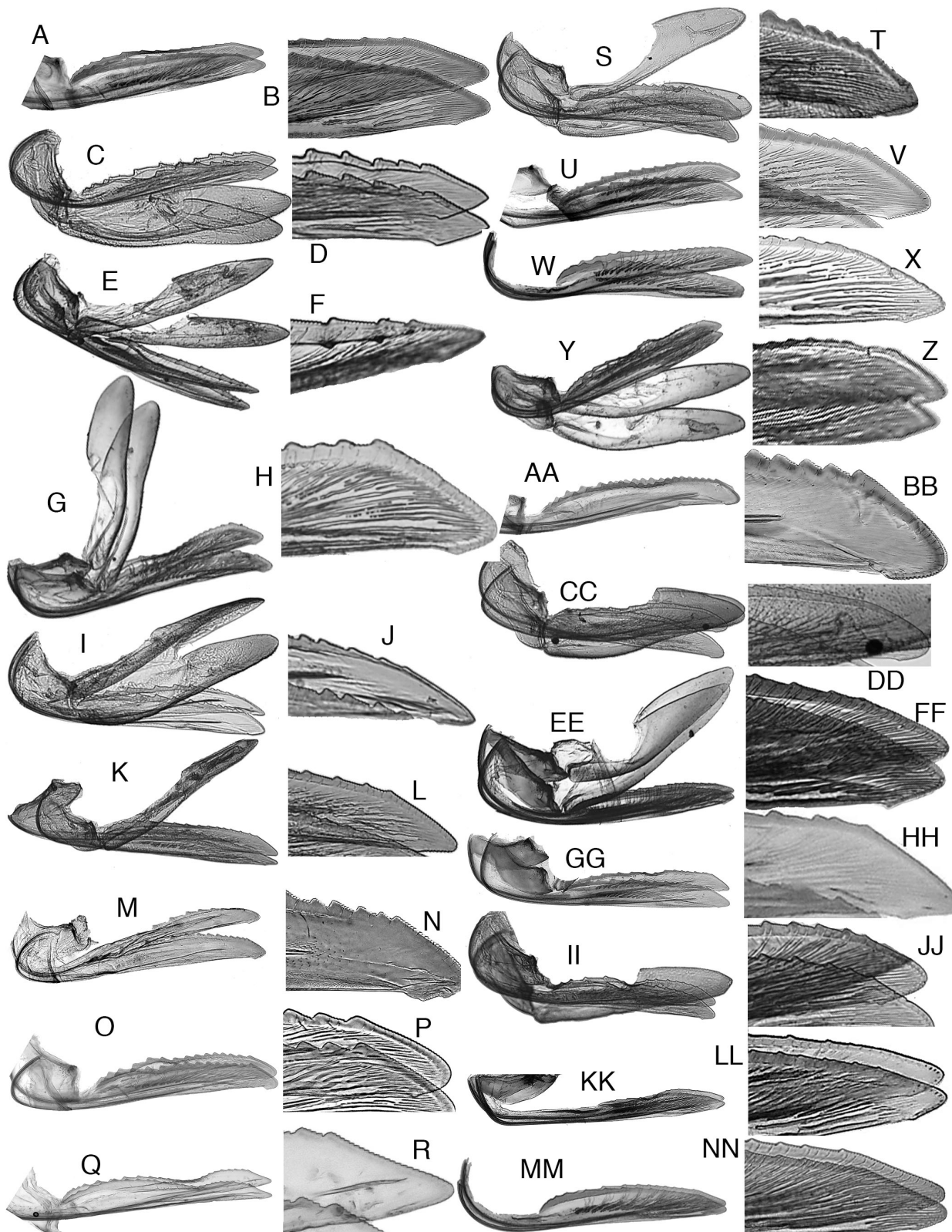
(Figs 2AA–BB, 3A, 7JJ–NN)

**Description.** Length of male 5.2–5.4 mm. Coloration. Black overall; crown with two pairs of orange marginal spots, forewing clavus with large bright yellow transcommissural marking constricted near middle, corium black with small semicircular clear area near apex of costal margin; legs yellow. Structure. Head moderately produced with crown anterior margin parabolic; face with frontoclypeus and anteclypeus shagreen, distinct pits restricted to gena, clypeal suture weakly delimited. Forewing venation poorly delimited, without supernumerary branches or crossveins.



**FIGURE 8.** *Makilingia* spp. female sternite VII. A, *M. banahaoensis*; B, *M. colorata*; C, *M. flavifrons*; D, *M. frontalis*; E, *M. haightiana*; F, *M. intermedia*; G, *M. lineata*, holotype; H, *M. maculata*; I, *M. nigra*; J, *M. pallida*; K, *M. panayensis*, holotype; L, *M. paranigra*; M, *M. pruinosa*; N, *M. sibuyanensis*; O, *M. similima*; P, *M. speciosa*; Q, *M. tenebrifrons*; R, *M. tettigonoides*; S, *M. uncinata*; T, *M. viraktamathi*. Note: the sternites were removed from the cleared abdomens and temporarily slide mounted; therefore, they appear broader than they do in their natural (curved) positions when attached to the abdomen.





**FIGURE 9.** *Makilingia* spp. females; dissected parts of ovipositor, showing detail of second valvula apex. Third valvulae (gonoplares) remain attached in C, E, G, I, K, O, S, Y, CC, EE, and GG. A–B, *M. banahaoensis*; C–D, *M. colorata*; E–F, *M. flavifrons*; G–H, *M. frontalis*; I–J, *M. haightiana*; K–L, *M. intermedia*; M–N, *M. lineata*; O–P, *M. maculata*; Q–R, *M. nigra*; S–T, *M. pallida*; U–V, *M. panayensis*; W–X, *M. paranigra*; Y–Z, *M. pruinosa*; AA–BB, *M. sibuyanensis*; CC–DD, *M. similima*; EE–FF, *M. speciosa*; GG–HH, *M. tenebrifrons*; II–JJ, *M. tettigonoides*; KK–LL, *M. uncinata*; MM–NN, *M. viraktamathi*. Note: third valvulae (gonoplares) are attached except *M. banahaoensis*, *M. lineata*, *M. maculata*, *M. panayensis*, *M. paranigra*, *M. sibuyanensis*, *M. tenebrifrons*, *M. uncinata*, and *M. viraktamathi*.

Male genitalia. Pygofer appendage widened from base to distal third, then tapered and curved slightly dorsad, extended well beyond lobe. Subgenital plate relatively long, curved evenly dorsad, distal section darkly pigmented, dorsal callosity short and broad. Style with preapical lobe short and acute, preapical heel rounded and relatively broad. Aedeagus in lateral view with preatrium longer than shaft, broad and strongly curved; shaft short, broad, tubular, nearly straight, apex with distinct anterior arcuate rim; atrial process bowl-shaped; in posterior view with preatrium weakly constricted, atrial processes curved dorsad.

Female unknown.

**Etymology.** The species name combines "*xanthos*" (yellow) with "*picta*" (painted) referring to the bright yellow markings on the forewings.

**Material examined.** Holotype male labeled "Philippines: Prov Calamarines/ Norte. Mount Labo, Basecamp 14°04.546'N 122°46.146'E 237m/ 20.v.2016 Pan Traps/ Siler Brachymeles Expedition 2" (PNM); 3 male paratypes, same data (OMNH, INHS).

**Notes.** This species closely resembles *M. intermedia* and *M. maculata* in coloration but differs in the structure of the aedeagus, which has the lateral processes of the atrium bowl-shaped and the apex of the shaft with an arcuate anterior marginal rim.

## Acknowledgments

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