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## Five New Species of *Brunettia* (Psychodidae: Diptera) from Taiwan 【Research report】

### 臺灣產黑蛾蚋屬（蛾蚋科：雙翅目）五種新種【研究報告】

Yaw-Tone Huang and Chin-Seng Chen  
黃耀通\*、陳錦生

\*通訊作者E-mail: [hytone@mail.thu.edu.tw](mailto:hytone@mail.thu.edu.tw)

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#### Abstract

Five species of the genus *Brunettia* Annandale, 1910 from Taiwan are described and illustrated. All five species belong to the subgenus *Brunettia* and are new to science: *Brunettia* (Br.) *lungjingensis* n. sp., *B.* (Br.) *autumna* n. sp., *B.* (Br.) *rotundior* n. sp., *B.* (Br.) *setiala* n. sp., and *B.* (Br.) *subdisiunctio* n. sp. A key to males of species of *Brunettia* in Taiwan is provided.

#### 摘要

本文描述台灣地區黑蛾蚋屬(*Brunettia* Annandale)昆蟲5個新種，這5個新種均屬於黑蛾蚋亞屬(Subgenus *Brunettia*)；分別是*Brunettia* (Br.) *lungjingensis* n. sp. 龍井黑蛾蚋、*B.* (Br.) *autumna* n. sp. 秋天黑蛾蚋、*B.* (Br.) *rotundior* n. sp. 圓眼黑蛾蚋、*B.* (Br.) *setiala* n. sp. 垂毛黑蛾蚋和 *B.* (Br.) *subdisiunctio* n. sp. 離眼黑蛾蚋。文中亦提供該5種黑蛾蚋之雄蟲檢索表。

**Key words:** Psychodidae, *Brunettia*, new species, taxonomy, Taiwan.

**關鍵詞:** 蛾蚋科、黑蛾蚋屬、新種、分類、台灣

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# Five New Species of *Brunettia* (Psychodidae: Diptera) from Taiwan

Yaw-Tone Huang\* and Chin-Seng Chen Department of Biology, Tunghai University, Taichung 407, Taiwan, R.O.C

## ABSTRACT

Five species of the genus *Brunettia* Annandale, 1910 from Taiwan are described and illustrated. All five species belong to the subgenus *Brunettia* and are new to science: *Brunettia* (*Br.*) *lungjingensis* n. sp., *Br.* (*Br.*) *autumna* n. sp., *Br.* (*Br.*) *rotundior* n. sp., *Br.* (*Br.*) *setiala* n. sp., and *Br.* (*Br.*) *subdisiunction* n. sp. A key to males of species of *Brunettia* in Taiwan is provided.

Key words: Psychodidae, *Brunettia*, new species, taxonomy, Taiwan.

## Introduction

*Brunettia* Annandale, 1910 is a genus of large-sized psychodids. About 90 species have been described, and are distributed mainly in the Australian and Oriental regions. Only one species, *Br. albonotata*, had hitherto been recorded from Taiwan (Duckhouse, 1973; Lin and Chen, 1999). The present paper describes five additional species new to science from Taiwan.

## Materials and Methods

Specimens were collected in 6-W UV light traps at night. The mothfly specimens were sorted and preserved in 75% alcohol. Specimens from which the type series was designated for each taxon were mounted on glass slides with Canada balsam using ordinary procedures.

The terminology used in this study follows that of Quate (1996) and Duckhouse (1991).

Type series of all new species are deposited in the collection of the Depart-

ment of Biology, Tunghai University.

## Descriptions

Genus *Brunettia* Annandale, 1910

Eye bridge with 3 rows of facets, that of the female separated, that of the male mostly contiguous. Antenna with 13 or 14 nodiform or shoe-shaped flagellomeres. Palpus very long with short palpomere 1. Labella bulbous, with large bristles. Wing with vestiture on part or all of the membrane, often with hair and scales; some males with a very broad wing. Aedeagus symmetrical, flanked by a pair of parameres, surstyle short with multiple, clavates or umbellate tenacula. Subgenital plate uniform, broad, with 2 parallel distal lobes (Satchell, 1955; Quate, 1962a; Duckhouse, 1966, 1991; Quate, 1996).

Duckhouse (1991) divided *Brunettia* into 6 subgenera, i.e. *Brunettia*, *Plesiobrunettia*, *Atrichobrunettia*, *Maurobrunettia*, *Campanulobrunettia*, and *Horobrunettia*. All Taiwanese *Brunettia* belong to the subgenus *Brunettia*.

\*Correspondence address  
e-mail:hytone@mail.thu.edu.tw

Subgenus *Brunettia* Annandale, 1910

Antennae with ascoids digitate, wing usually showing sexual dimorphism, that of the male enlarged in humeral and anal regions. Radial fork almost basal to medial fork;  $R_5$  often ending at wing tip. Gonostyle always with 2 enlarged pre-apical setae, surstyle short with (i) distal cluster of longer tenacula having fringed and usually hooded tips, some generally with angled stems, and (ii) some short straight tenacula adjacent to main cluster but placed more distally or ventrally.

*Brunettia lungjingensis* n. sp. (Figs. 1-9)

Male: Antenna with scape about 2 x length of pedicel, flagellomeres shoe-shaped, broken off, missing after flagellomere 3, ascoids simple. Eye bridge with 3 rows of facets; eye bridge contiguous. Hair patch on frons as figured (Fig. 1), labellum bulbous with several setae, palpus formula: 6:25:26:29.5.

Wing broad with sparse scaling, humeral and anal regions enlarged; radial fork slightly basal to medial fork, tip of  $CuA_2$  somewhat indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending at wing apex.

Aedeagus with slender base about 1.5 x length of apical shafts, parameres about 1.5 x length of apical shafts of aedeagus and at same level as gonocoxite. Surstyle short, with 3 clusters of tenacula: tenacula with very short and straight stem, short and bent stem, long and bent stem, respectively, for each cluster.

Measurements: Wing length 1.88 mm, width 1.18 mm, ratio of wing length to width 1.59, palpus 0.70 mm.

Female: Antenna with scape about 2.3 x length of pedicel, flagellomeres broken off, missing. Eye bridge with 3 rows of facets; eye bridge separated by 4.5 facet diameters. Hair patch on frons as figured (Fig. 6), labellum bulbous with several setae, palpus formula: 6:27:29:-.

Wing slender with sparse scaling, humeral and anal regions not enlarged; radial fork slightly basal to medial fork, tip

of  $CuA_2$  broad but indistinct,  $R_{2+3}$  as long as  $R_s$ ,  $R_5$  ending at wing apex.

Genitalia as figured (Figs. 8, 9); subgenital plate with a pair of well-separated lobes, spermatheca wide and cercus longer than in other Taiwanese *Brunettia*.

Measurements: Wing length 2.06 mm, width 1.1 mm, ratio of wing length to width 1.87.

Materials examined: Holotype: , TAICHUNG: Lungjing, 1- -1996, Y. T. Huang; Paratype: 1 , Lungjing, 1- -1996, Y. T. Huang.

Distribution: Endemic to Taiwan.

Etymology: The specific name, *lungjing*, refers to the name of the type locality, Lungjing Village, Taichung County.

Remarks: This species is very similar to *Brunettia orbicularis* Quate and Quate, 1967 with the characters of having a radial fork basal to medial fork, a similar palpus formula, wing ratio, and venation. But the parameres of *Br. lungjingensis* n. sp. are longer than those of *Br. orbicularis*, and the base of the gonostyle is broader than that of *Br. orbicularis*.

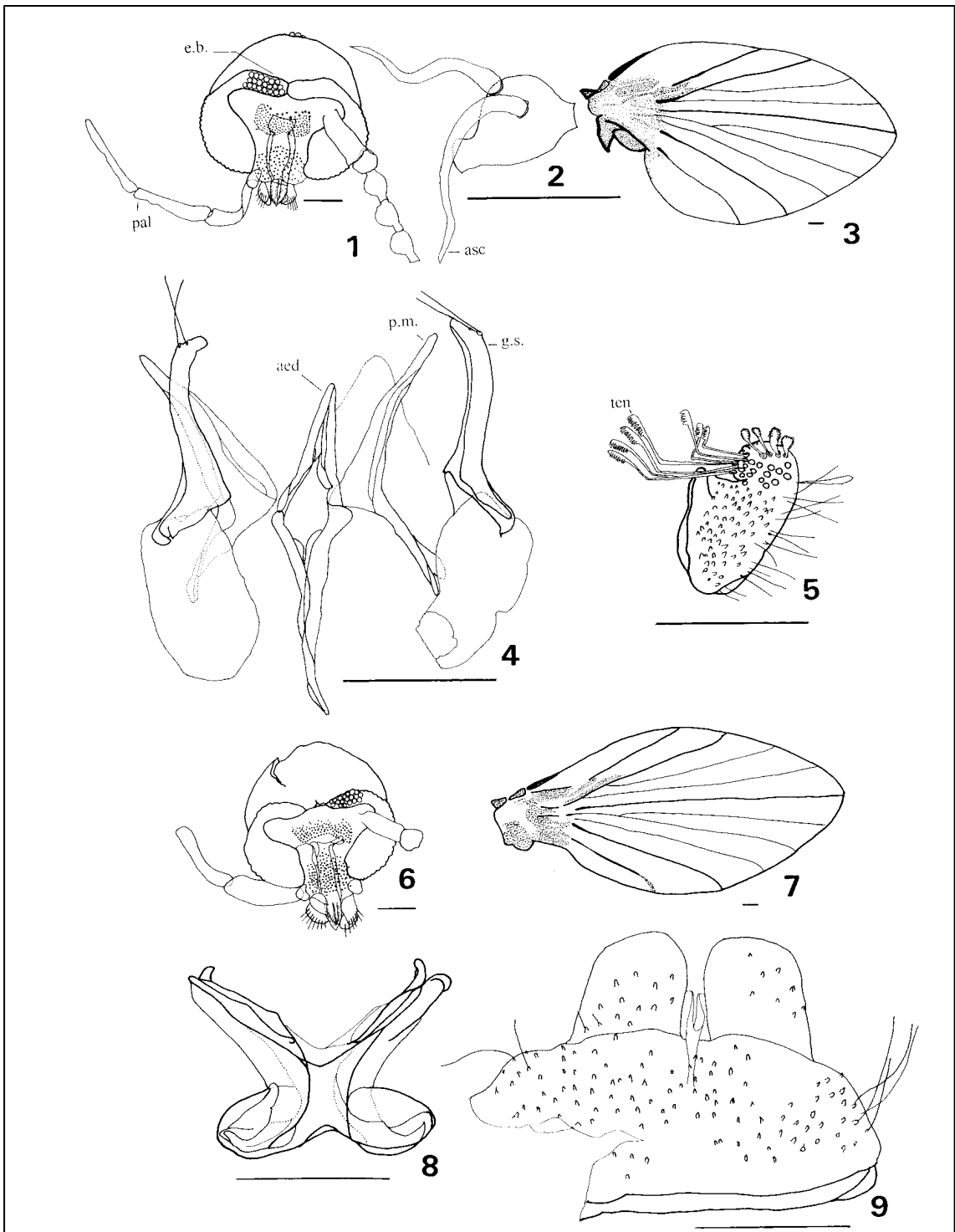
*Br. lungjingensis* n. sp. is the largest species of *Brunettia* in Taiwan.

*Brunettia autumn* n. sp. (Figs. 10-19)

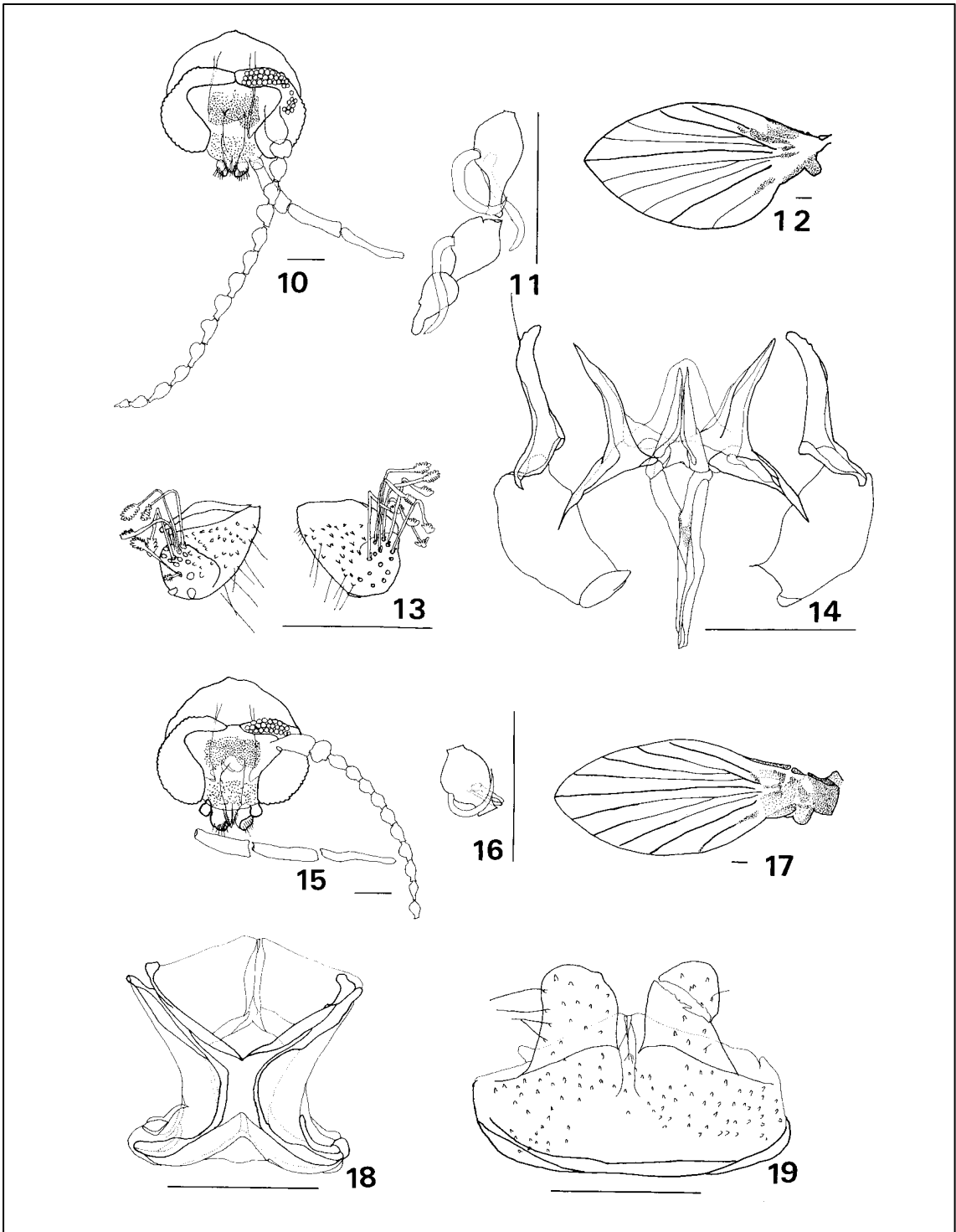
Male: Antenna with scape about 2 x length of pedicel, 13 shoe-shaped flagellomeres, internode of flagellomere 12 shorter and flagellomere 13 smaller than preceding ones, ascoids simple. Eye bridge contiguous, with 3 rows of facets. Hair patch on frons as figured (Fig. 10), labellum bulbous with several setae, palpus short, formula: 4:18:19:21.

Wing normal, with scaling on basal region; humeral and anal regions normal; radial fork slightly basal to medial fork, base of  $CuA_2$  indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending at wing apex.

Aedeagus with basal shafts about 1.7 x length of apical shafts, parameres about 1.3 x length of apical shafts of aedeagus



Figs. 1-9. *Brunettia lungjingensis* n. sp. 1-5, male: (1) head; (2) flagellomere 3; (3) wing; (4) genitalia; (5) surstyle. 6-9, female: (6) head; (7) wing; (8) spermatheca; (9) subgenital plate. (e.b., eye bridge; pal, palpus; asc, ascoids; ten, tenaculum; g.s., gonostyle; aed, aedeagus; p.m., paramere) (Scale bar = 0.1 mm).



Figs. 10-19. *Brunettia autumn* n. sp. 10-14, male: (10) head; (11) tip of antenna; (12) wing; (13) surstyle; (14) genitalia. 15-19, female: (15) head; (16) flagellomere 5; (17) wing; (18) spermatheca; (19) subgenital plate (Scale bar = 0.1 mm).

and longer than gonostyle. Surstyle short and broad, with 2 clusters of tenacula: tenacula with short and straight stem, and long and bent stem, respectively, for each cluster.

Measurements: Antenna 0.93-0.98 mm, wing length 1.38-1.55 mm, width 0.74-0.86 mm, ratio of wing length to width 1.80-1.86, palpus 0.50-0.52 mm.

Female: Antenna with scape about 2 x length of pedicel, flagellomeres subshoe-shaped, flagellomere 13 broken off, missing; unbranched ascoids curved into loop. Eye bridge with 3 rows of facets; eye bridge separated by 3 facet diameters. Hair patch on frons as figured (Fig. 15), labellum bulbous with several setae, palpus formula: 4:19:22:24.5.

Wing slender, humeral and anal regions normal; radial fork slightly basal to medial fork, tip and base of  $CuA_2$  indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending at wing apex.

Genitalia as figured (Figs. 18, 19); subgenital plate with a pair of well-separated lobes, spermatheca squared.

Measurements: Antenna 0.68 mm (segments 1-12), wing length 1.58 mm, width 0.76 mm, ratio of wing length to width 2.08, palpus 0.56 mm.

Materials examined: Holotype: , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang; Paratypes: 2 1 , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang.

Distribution: Endemic to Taiwan.

Etymology: The specific name *autumna*, is Latin for autumnal; referring to the collection season of the type specimen.

Remarks: *Br. autumnna* n. sp. is similar to *Brunettia mindanensis* Quate, 1965, with radial fork slightly basal to medial fork, humeral region a little enlarged, and similar eye bridge and antennal structure; but  $R_5$  of *Br. mindanensis* ends beyond wing apex, and parameres of *Br. mindanensis* are longer than gonostyle.

Male genitalia of *Br. autumnna* n. sp. is

very similar to that of *Br. recepta* Quate, 1965, but both *Br. autumnna* n. sp. and *Br. mindanensis* differ from *Br. recepta* in having slender wings and short base shafts of the aedeagus.

*Brunettia rotundior* n. sp. (Figs. 20-29)

Male: Antenna with scape about 2 x length of pedicel, 13 shoe-shaped flagellomeres, flagellomere 12 without internode, and flagellomere 13 smaller than preceding ones, ascoids simple and curved. Eye bridge with 3 rows of facets; tip of eye bridge rounded, contiguous. Hair patch on frons as figured (Fig. 20), labellum bulbous with several setae, palpus formula: 4:19:20:22.5.

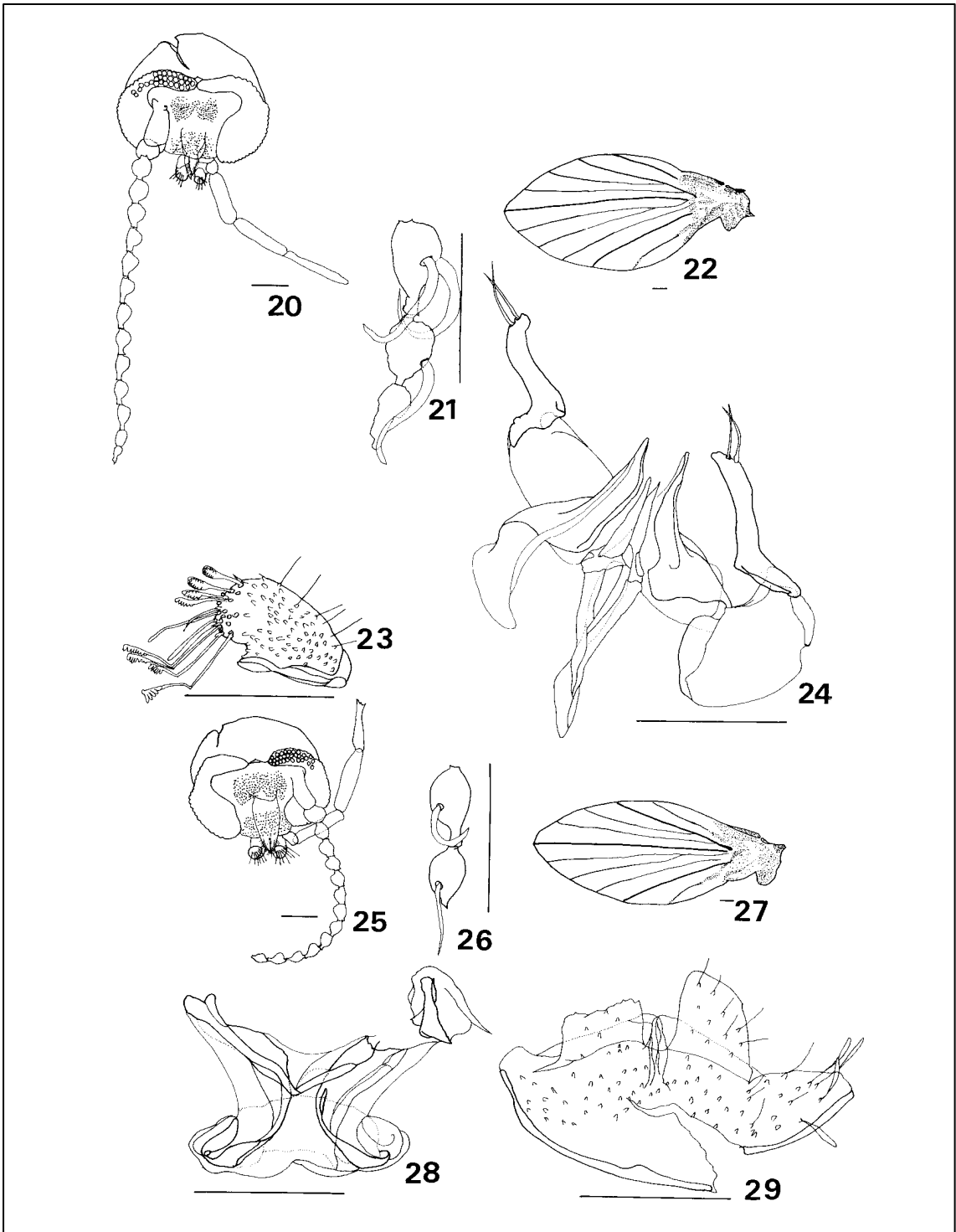
Wing with humeral and anal regions normal; radial fork slightly basal to medial fork, base of  $CuA_2$  indistinct,  $R_{2+3}$  a little longer than  $R_s$ ,  $R_5$  ending at wing apex.

Aedeagus with basal shafts about 1.7 x length of apical shafts, parameres about 1.1 x length of apical shafts of aedeagus and shorter than gonostyle, basal style of parameres broad without a pointed tip. Surstyle short and broad, with 2 clusters of tenacula: tenacula with short and straight stem, and long and bent stem, respectively, for each cluster.

Measurements: Antenna 0.96-1.03 mm, wing length 1.46-1.50 mm, width 0.78-0.80 mm, ratio of wing length to width 1.83-1.92, palpus 0.52-0.54 mm.

Female: Antenna with scape about 2.2 x length of pedicel, flagellomeres subshoe-shaped with short internode, internode of flagellomere 12 shorter than preceding ones, flagellomere 13 broken off, missing, ascoids on flagellomeres 1-11 unbranched, slender and curved, but straight on 12. Eye bridge with 3 rows of facets; eye bridge separated by 3.5-4 facet diameters. Hair patch on frons as figured (Fig. 25), labellum bulbous with several setae, palpus formula: 4:18.5:20:-.

Wing narrow; radial fork slightly basal to medial fork, tip and base of  $CuA_2$  indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending



Figs. 20-29. *Brunettia rotundior* n. sp. 20-24, male: (20). head; (21) tip of antenna; (22) wing; (23) surstyle; (24) genitalia. 25-29, female: (25) head; (26) flagellomeres 11, 12; (27) wing; (28) spermatheca; (29) subgenital plate (Scale bar = 0.1 mm).

at wing apex.

Genitalia as figured (Figs. 28, 29); subgenital plate with a pair of well-separated lobes, spermatheca wide, cercus short.

Measurements: Antenna 0.74 mm (segments 1-14), wing length 1.48-1.66 mm, width 0.72-0.76 mm, ratio of wing length to width 2.06-2.18.

Materials examined: Holotype: , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang; Paratypes: 2 2 , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang.

Distribution: Endemic to Taiwan.

Etymology: The specific name *rotundior*, is Latin for rounder, referring to the characteristics of the contiguous but rounded tip of the eye bridge of the male.

Remarks: The contiguous but rounded tip of the eye bridge of the male *Br. rotundior* n. sp. is similar to that of the Philippines species, *Br. nubicola* and *Br. recepta* (Quate, 1965). The separated lobes of the subgenital plate of *Br. recepta* have rounded tips, and the distances between the basal and apical shafts of the aedeagus are the same. These are the critical differences between the 2 species.

*Br. nubicola* has very conspicuous parameres, and the anal and humeral regions of the wing are enlarged, differentiating it from *Br. rotundior* n. sp.

*Brunettia setiala* n. sp. (Figs. 30-39)

Male: Antenna with scape about 2 x length of pedicel, 13 shoe-shaped flagellomeres, flagellomere 12 with short internode, and flagellomere 13 smaller than preceding ones, ascoids on flagellomeres 1-11 simple and slightly curved, but straight on 12. Eye bridge with 3 rows of facets, contiguous. Hair patch on frons as figured (Fig. 30), labellum bulbous with several setae, palpus formula: 4:18:18.5:22.

Wing with humeral and anal regions normal; radial fork well basal to medial fork, base of  $CuA_2$  indistinct,  $R_{2+3}$  as long as  $R_s$ ,  $R_5$  ending at wing apex. Jugum of

wing bearing a compact tuft of fine dark hair on anterior lobe, supported by sclerotized struts, basal region of wing with dense scaling.

Aedeagus with very long basal shafts, about 2 x length of apical shafts; parameres with large and round basal style, apical style of parameres about 1.5 x length of the apical shafts of aedeagus. Surstyle with 3 clusters of tenacula: tenacula with very short and straight stem, short and bent stem, and long and bent stem, respectively, for each cluster.

Measurements: Antenna 1.02-1.03 mm, wing length 1.48-1.50 mm, width 0.78-0.80 mm, ratio of wing length to width 1.88-1.90, palpus 0.51-0.53 mm.

Female: Antenna with scape about 2 x length of pedicel, 13 shoe-shaped flagellomeres, internode of flagellomere 12 shorter than preceding ones, flagellomere 13 small, ascoids on flagellomeres 1-11 simple, short, slightly curved, but straight on 12. Eye bridge with 3 rows of facets; eye bridge separated by 3 facet diameters. Hair patch on frons as figured (Fig. 35), labellum bulbous with several setae, palpus formula: 4:18.5:19.5:21.5.

Wing narrow; radial fork well basal to medial fork, base of  $CuA_2$  indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending at wing apex.

Genitalia as figured (Figs. 38, 39); subgenital plate with a pair of well-separated lobes, spermatheca wide, cercus short.

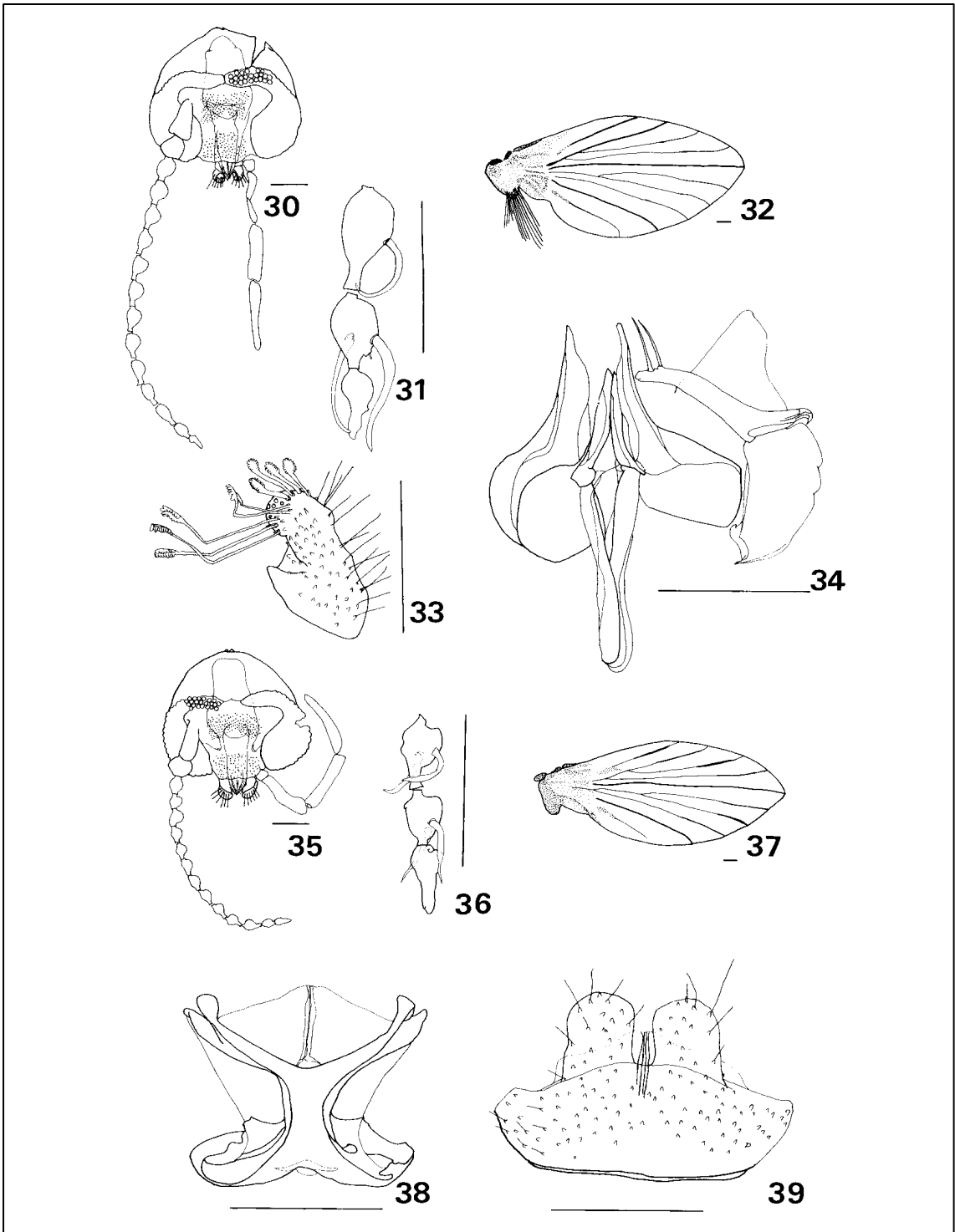
Measurements: Antenna 0.74 mm, wing length 1.48-1.5 mm, width 0.78-0.80 mm, ratio of wing length to width 1.88-1.90, palpus 0.51-0.53 mm.

Materials examined: Holotype: , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang; Paratypes: 2 2 , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang.

Distribution: Endemic to Taiwan.

Etymology: The specific name, *set-* and *ala*, is Latin for bristle and wing, respectively, referring to the jugum of the wing bearing a compact tuft of fine dark hair on the anterior lobe.





Figs. 30-39. *Brunettia setiala* n. sp. 30-34, male: (30) head; (31) tip of antenna; (32) wing; (33) surstyle; (34) genitalia. 35-39, female: (35) head; (36) tip of antenna; (37) wing; (38) spermatheca; (39) subgenital plate (Scale bar = 0.1 mm).

Remarks: *Br. setiala* n. sp. is similar to *Br. rotundior* n. sp. in wing shape, and vein and palpus formula, except for the compact tuft of fine dark hair on the anterior lobe of the wing, and the large and round base style of the parameres which are the critical characters distinguishing this from other *Brunettia* species from Taiwan.

A compact tuft of fine dark hair on the anterior lobe of wing is one of the characters of the subgenus *Maurobrunettia* (Duckhouse, 1991), but *Br. setiala* n. sp. lacks the very broad head, elongated and enlarged scape and pedicel characteristic of the subgenus *Maurobrunettia*.

*Brunettia subdisiunctio* n. sp. (Figs. 40-49)

Male: Antenna with scape about 1.8 x length of pedicel, 13 shoe-shaped flagellomeres, flagellomere 12 with short internode, and flagellomere 13 smaller than preceding ones, ascoids on flagellomeres 1-11 simple and curved into loop, but straight on 12. Eye bridge with 3 rows of facets, separated by 0.5 facet diameters. Hair patch on frons as figured (Fig. 40), labellum bulbous with several setae, palpus formula: 4:18.5:19:19.5.

Wing with humeral and anal regions normal; radial fork well basal to medial fork, base and tip of  $CuA_2$  indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending at wing apex. Wing with heavy hair and sparse scaling on veins.

Aedeagus with base shafts about 1.6 x length of apical shafts, parameres about 1.1 x length of apical shafts of aedeagus and slightly longer than gonostyle, base style of parameres slender. Tenacula of surstyle bifurcated, but most tenacula broken off at the bent point.

Measurements: Antenna 1.02 mm, wing length 1.46 mm, width 0.80 mm, ratio of wing length to width 1.83, palpus 0.50 mm.

Female: Antenna with scape about 2 x

length of pedicel, 13 subshoe-shaped flagellomeres, internode of flagellomere 12 shorter than preceding ones, flagellomere 13 small, ascoids on flagellomeres 1-11 simple, short and curved, but straight on 12. Eye bridge with 3 rows of facets; eye bridge separated by 3 facet diameters. Hair patch on frons as figured (Fig. 45), labellum bulbous with several setae, palpus formula: 4:19:20:20.

Wing narrow; radial fork well basal to medial fork, base and tip of  $CuA_2$  indistinct,  $R_{2+3}$  longer than  $R_s$ ,  $R_5$  ending at wing apex.

Genitalia as figured (Figs. 48, 49); subgenital plate with pair of well-separated lobes, spermatheca wide, cercus longer than others.

Measurements: Antenna 0.65 mm, wing length 1.55 mm, width 0.74 mm, ratio of wing length to width 1.83, palpus 0.51 mm.

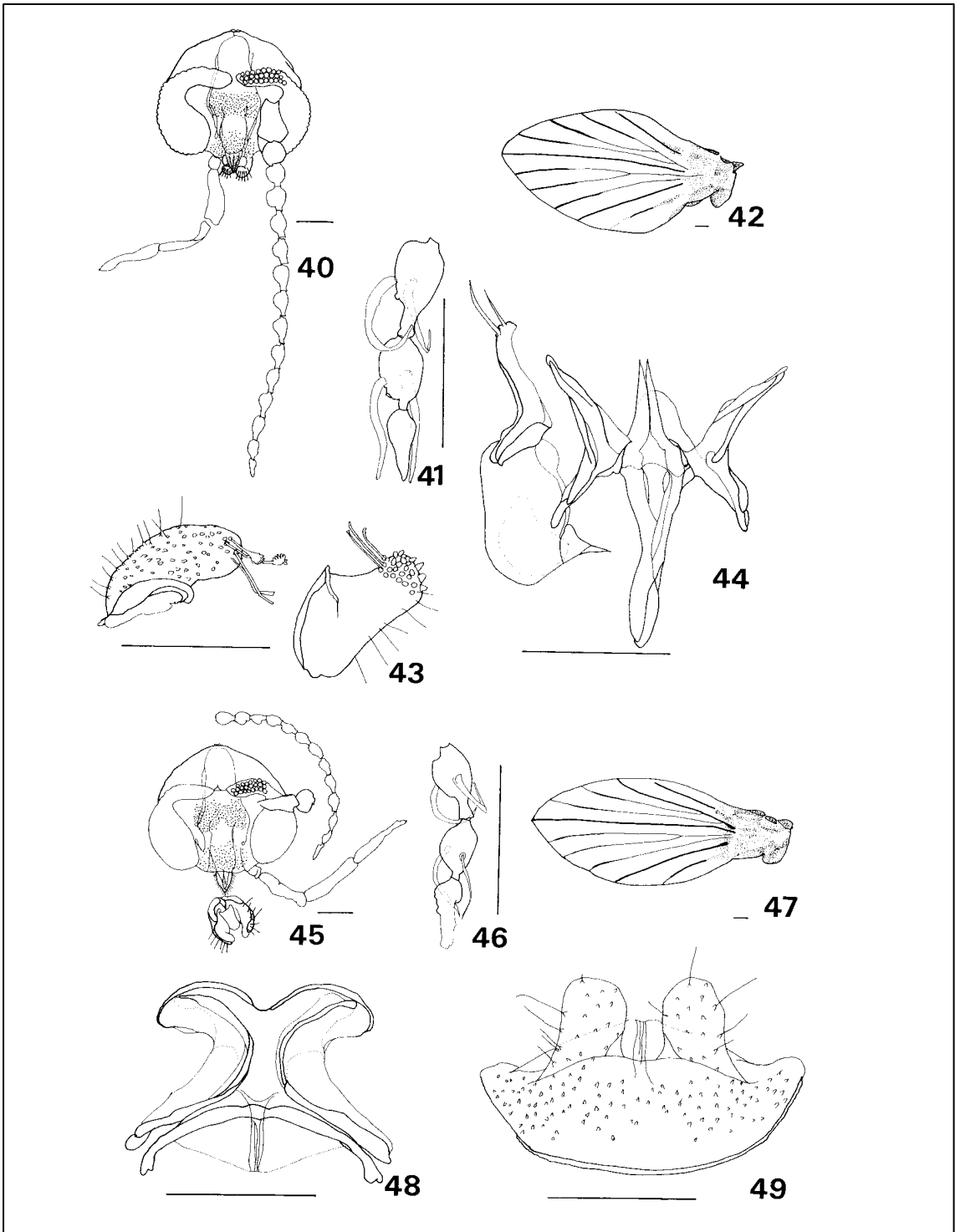
Materials examined: Holotype: , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang; Paratype: 1 , TAICHUNG: Tunghai Univ., 19- -1999, Y. T. Huang.

Distribution: Endemic to Taiwan.

Etymology: The specific name, *disiunctio*, is Latin for separation, referring to the small separation of the eye bridge in the male.

Remarks: Eye bridges of male psychodids of most species of the subgenus *Brunettia* are contiguous, but those of males of *Br. subdisiunctio* n. sp. are separated. *Br. (Br.) alicae* Duckhouse, 1991, *Br. (Br.) pumilis* Quate and Quate, 1967, *Br. (Br.) sedlaceae* Quate and Quate, 1967, and *Br. (Br.) soror* Duckhouse, 1991 also have separated eye bridges, but they are separated by 1.5, 3, 3-4, and 3.6 facet diameters, respectively; *Br. (Br.) alicae* also has a more slender surstyle and a straight tenaculum.

Heavy hair on the wing vein is also one of the critical characters distinguishing this species from other *Brunettia* from Taiwan.



Figs. 40-49. *Brunettia subdisiunctio* n. sp. 40-44, male: (40) head; (41) tip of antenna; (42) wing; (43) surstyle; (44) genitalia. 45-49, female: (45) head; (46) tip of antenna; (47) wing; (48) spermatheca; (49) subgenital plate (Scale bar = 0.1 mm).

## Discussion

There are 26 species of *Brunettia* from the Oriental region (Quate, 1966; Duckhouse, 1973). Of those, there are five species of *Brunettia* from Malaya, i.e., *Br. albonotata* (Brunetti, 1908), *Br. alternata* Satchell, 1955, *Br. pendleburyi* Satchell, 1955, *Br. tormentosa* Satchell, 1955, and *Br. triangulata* Satchell, 1955 (Brunetti, 1908; Satchell, 1955).

Both *Br. albonotata* and *Br. triangulata* have white spots at the tips of all veins (composed of small, snow-white scale-like hairs) and a long palpus 4 which differ from all five new Taiwanese *Brunettia*. The antenna of *Br. triangulata* only has 15 segments. The enlarged humeral and anal regions of *Br. pendleburyi* are similar to those of *Br. (Br.) lungjingensis* n. sp., but the wing length of the former is longer than that of the latter (2.3 vs. 1.88 mm). The very slender gonostyle, the surstyle without a short and straight-stemmed tenaculum, and the 15-segmented antenna of these two species also differ from all five new Taiwanese *Brunettia* species (Satchell, 1955).

Regarding the other Malayan species, *Br. alternata* Satchell, 1955 is a junior homonym of *Br. (Atrichobrunettia) alternata* Satchell, 1953, and was thought not to be a true *Brunettia* species (Satchell, 1953, 1955; Duckhouse, 1966, 1991). *Br. tormentosa* Satchell, 1955 has *Pericomalike* flagellomeres, but both the subgenital plate and spermatheca are not the standard form of *Brunettia*. Therefore, we doubt whether this species is a true *Brunettia* (Satchell, 1955).

There are three species of *Brunettia* from Sri Lanka, i.e., *Br. albohumeralis* (Brunetti, 1911), *Br. albonotata*, and *Br. atrisquamis* (Brunetti, 1908). The  $R_5$  vein of *Br. albohumeralis* ends at the posterior edge of the wing tip (Brunetti, 1911; Quate, 1962a); *Br. atrisquamis* has a very short apical shaft of the aedeagus (about 1/2x length of basal shaft), and white spots at

the tip of veins (Brunetti, 1908; Quate, 1962a). These characters reveal that both species differ from the Taiwanese species.

There are seven species of *Brunettia* from India, i.e., *Br. albonotata*, *Br. annandalei* (Brunetti, 1908), *Br. argenteopunctata* (Brunetti, 1908), *Br. atrisquamis*, *Br. novemnotata* (Brunetti, 1911), *Br. squamipennis* (Brunetti, 1908), and *Br. superstes* (Annandale, 1908).

*Br. novemnotata* is very similar to *Br. albonotata* and possibly a synonym of that species, but additional specimens are needed to fully identify this species. Characters of the other four Indian species which differ from Taiwanese *Brunettia* are listed below. *Br. annandalei* has white spots at the tip of veins,  $R_5$  ending at the posterior edge of the wing tip, and has spindle-like flagellomeres (Brunetti, 1908; Quate, 1962a). *Br. argenteopunctata* has white spots at the tips of veins, 15-segmented antennae, and the basal part of the subgenital plate is very short but wide (Brunetti, 1908; Quate, 1962a). *Br. squamipennis* has white spots at the tips of the veins, and the R fork is well distal to the M fork (Brunetti, 1908; Quate, 1962a). *Br. superstes* has 15-segmented antennae, a long apical shaft of the aedeagus, and a short, rounded tip of the gonostyle (Annandale, 1910; Quate, 1962a).

Quate (1962b) reported two species of *Brunettia* from Borneo, i.e., *Br. brevifurca* Satchell, 1955 and *Br. orchestris* Quate, 1962. *Br. brevifurca* has a very large (3 mm long) and very broad (ratio of wing length to width 1.5) wing that is larger than that of *Br. lungjingensis* n. sp., which is the largest species of *Brunettia* in Taiwan. The curved tip of the gonostyle and the very short apical shaft of the aedeagus are two critical characters to Taiwanese *Brunettia* (Satchell, 1955). *Br. orchestras* has 14-segmented antennae, all tenacula have a straight stem and narrow subgenital plate and differ from the Taiwanese *Brunettia* (Quate, 1962b).

Eleven species of *Brunettia* were

reported from the Philippines by Quate (1965), i.e., *Br. amoena* (Quate, 1965), *Br. exulans* Quate, 1965, *Br. hispida* Quate, 1965, *Br. kibawa* Quate, 1965, *Br. mateola* Quate, 1965, *Br. mindanensis* Quate, 1965, *Br. nubicola* Quate, 1965, *Br. pallens* Quate, 1965, *Br. parexulans* Quate, 1965, *Br. recepta* Quate, 1965, and *Br. yoshimotoi* Quate, 1965.

*Br. amoena*, which belongs to the subgenus *Atrichobrunettia*, will not be discussed here. The critical characters of *Br. mindanensis*, *Br. nubicola*, and *Br. recepta* differ from those of the Taiwanese *Brunettia* as discussed above. Characters of the other seven species, which differ from Taiwanese *Brunettia*, are listed below. *Br. exulans* has a very large (2.45 mm long) and very broad (ratio of wing length to width 1.29) wing, 15-segmented antennae, and very long ascoids. *Br. hispida* has wings similar to *Br. lungjingensis* n. sp., but the ascoids are very long. The flagellomere are slender (spindle-like), and the basal shaft of the aedeagus is shorter. *Br. kibawa* has broad wings. Both the gonostyle and apical shaft of the parameres have a broad base, and the ascoids are long. *Br. mateola* has V-shaped ascoids, and 15-segmented antennae. The apical shaft of the aedeagus is as long as the apical shafts of the paramere and gonostyle. *Br. pallens* has V-shaped ascoids and 15-segmented antennae. The R fork is distal to the M fork, and R<sub>5</sub> ends at the posterior edge of the wing tip. The eye bridge of the male is separated. *Br. parexulans* has a very broad wing (wing width 1.87 mm). The apical shaft of the aedeagus is long (about 0.95 x length of paramere). *Br. yoshimotoi* has 15-segmented antennae, the ascoids are very broad and foliate, and the male genitalia is greatly aberrant (Quate, 1965).

The last *Brunettia* species of the Oriental region is *Br. spinistoma* Tokunaga and Etsuko, 1954 from Ryukyu (Quate, 1966). *Br. spinistoma* is similar to *Br. lungjingensis* n. sp. in wing and

venation, but the wing (male) of *Br. spinistoma* is broader than that of *Br. lungjingensis* n. sp. (1.66 vs. 1.59 mm), and wings of the former have small white tuft scales on the tips of the veins (Tokunaga and Etsuko, 1954).

There are two species of *Brunettia* from Japan, i.e., *Br. ishiharai* Tokunaga and Etsuko, 1954 and *Br. lucidisquama* Tokunaga, 1959. The former has white spots on some veins, spindle-shaped flagellomeres, and 15-segmented antennae. The apical lobes of the subgenital plate are not well separated from the basal lobe. The characteristics of the male are unknown (Tokunaga and Etsuko, 1954; Tokunaga, 1959). The latter species has very long ascoids with a curved loop at the tip. The gonostyle is plump with a rounded tip. The aedeagus is greatly aberrant for those of *Brunettia* (Tokunaga, 1959). The characters of these two species also differ from those of all Taiwanese *Brunettia* species.

Key to the males of *Brunettia* from Taiwan\*

1. Wing length more than 1.75 mm, humeral and anal regions enlarged; length of palpus exceeding 0.65 mm ... .. *Br. lungjingensis* n. sp.
- Wing length less than 1.65 mm, humeral and anal regions normal; length of palpus less than 0.55 mm ... .. 2
2. Radial fork slightly basal to medial fork; wing with or without sparse hair or scaling ... .. 3
- Radial fork clearly basal to medial fork; with dense hair or scales on jugum, veins, and basal region of wing ... .. 4
3. Parameres short, about 1.1 x length of apical shafts of aedeagus, base style broad; tip of eye bridge rounded ... ..
- ... .. *Br. rotundior* n. sp.
- Parameres long, about 1.3 x length of apical shafts of aedeagus, base style slender; tip of eye bridge square ... ..
- ... .. *Br. autumnata* n. sp.

4. Parameres short, about 1.1 x length of apical shafts of aedeagus, base style slender; eye bridge separated ... ..  
 ... .. *Br. subddisiunctio* n. sp.
- Parameres very long, about 1.5x length of apical shafts of aedeagus, base style large and round; eye bridge contiguous ... ..  
 ... .. *Br. setiala* n. sp.

\*Duckhouse (1973a) and Lin and Chen (1999) included Taiwan as one of the distribution areas for *Br. albonotata* (Brunetti, 1908). The male of this taxon is still unknown.

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# 臺灣產黑蛾蚋屬(蛾蚋科：雙翅目)五種新種

黃耀通<sup>1</sup> 東海大學生物學系 台中市台中港路三段181號

陳錦生 東海大學生物學系 台中市台中港路三段181號

## 摘 要

本文描述台灣地區黑蛾蚋屬(*Brunettia* Annandale)昆蟲 5 個新種,這 5 個新種均屬於黑蛾蚋亞屬(Subgenus *Brunettia*);分別是 *Brunettia* (*Br.*) *lungjingensis* n. sp. 龍井黑蛾蚋, *Br.* (*Br.*) *autumna* n. sp. 秋天黑蛾蚋, *Br.* (*Br.*) *rotundior* n. sp. 圓眼黑蛾蚋, *Br.* (*Br.*) *setiala* n. sp. 垂毛黑蛾蚋和 *Br.* (*Br.*) *subdisiunctio* n. sp. 離眼黑蛾蚋。文中亦提供該 5 種黑蛾蚋之雄蟲檢索表。

關鍵詞：蛾蚋科、黑蛾蚋屬、新種、分類、台灣。