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Redescriptions of Five New Record Species of Psychodidae (Diptera) from Taiwan **【Research report】**

臺灣產五種蛾蚋科(雙翅目)昆蟲的重新描述 **【研究報告】**

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Abstract

Five species of Psychodidae are recorded as new to Taiwan: *Psychoda pseudominuta* Wagner, 1978, *Psychoda savaiiensis* Edward, 1928, *Psychoda trilobata* Tokunaga, 1957, *Telmatoscopus rivularis* Qate, 1962, and *Trichopsychoda coreanica* Wagner, 1978. The genus *Trichopsychoda* is published as new to Taiwan. All specimens were collected from central Taiwan and are redescribed and illustrated.

摘要

本文描述台灣地區蛾蚋科昆蟲五個種，這五個種均為台灣地區的新記錄種；分別是蛾蚋屬的 *Psychoda pseudominuta*, *Ps. savaiiensis*, *Ps. trilobata*、池畔蛾蚋屬的 *Telmatoscopus rivularis* 和多毛蛾蚋屬的 *Trichopsychoda coreanica*；其中多毛蛾蚋屬為台灣地區新記錄屬。所有的標本均採集自台灣中部地區。

Key words: Psychodidae, new record, taxonomy, Taiwan.

關鍵詞: 蛾蚋科、新記錄屬、新記錄種、分類、台灣

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Redescriptions of Five New Record Species of Psychodidae (Diptera) from Taiwan

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ABSTRACT

Five species of Psychodidae are recorded as new to Taiwan: *Psychoda pseudominuta* Wagner, 1978, *Psychoda savaiiensis* Edward, 1928, *Psychoda trilobata* Tokunaga, 1957, *Telmatoscopus rivularis* Quate, 1962, and *Trichopsychoda coreanica* Wagner, 1978. The genus *Trichopsychoda* is published as new to Taiwan. All specimens were collected from central Taiwan and are redescribed and illustrated.

Key words: Psychodidae, new record, taxonomy, Taiwan.

Introduction

The insect fauna of the family Psychodidae, the moth flies (except for the subfamily Phlebotominae), is poorly known in Taiwan. Psychodids are small nematoceran flies with gray to dark brown body color and are covered with long, flattened hairs. The head lacks an ocellus, and the compound eyes are with or without an eye bridge. The antennae are 12- to 16-segmented with single, paired, or clustered ascoids of different shapes. Mouthparts are well developed, and the labellum is bulbous, flattened, or elongate for bloodsucking. The wings are ovoid with nine to ten longitudinal veins, two forks (radial and medial forks), and almost no cross veins; the wings are held rooflike over the body at rest. The first abdominal sternite is reduced, and the female genitalia have heavily sclerotized cerci and a characteristic subgenital plate. The male

aedeagus is simple or complex, the gonopod consists of a proximal basistyle and an apical dististyle, and the surstyle bears one to more than forty tenacula.

Although some household species, e.g., *Tinearia alternata* and *Clogmia albipunctatus*, are common in Taiwan, taxonomic studies on these tiny flies have often been neglected since they have no adverse impact on people, animals, or plants.

Only two taxonomic studies of moth flies in Taiwan have been published (Tokunaga, 1957a; Huang and Chen, 1992). Twenty species belonging to six genera have been recorded: *Brunettia albonotata* (Brunetti, 1908), *Clogmia albipunctatus* (Williston, 1893), *Logima erminea* (Eaton, 1894), *Psychoda acanthostyla* Tokunaga, 1957, *Ps. alabangensis* del Rosario, 1936, *Ps. brevicerca* Huang and Chen, 1992, *Ps. duplilamnata* Tokunaga, 1957, *Ps. formosana* Tokunaga, 1957, *Ps.*

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formosiensis Tokunaga, 1957, *Ps. harrisi* Satchell, 1950, *Ps. longivirga* Huang and Chen, 1992, *Ps. makati* del Rosario, 1936, *Ps. musae* del Rosario, 1936, *Ps. pellucida* Quate, 1962, *Ps. phalaenoides* (L., 1758); *Ps. platilobata* Tokunaga, 1957, *Ps. pseudobrevicornis* Tokunaga, 1957, *Ps. subquadrilobata* Tokunaga, 1957, *Thornburghiella spinicornis*, and *Ti. alternata* (Say, 1824) (Brunetti, 1908) (Lien and Chen, 1974, Jezek, 1990; Lin and Chen, 1999).

This paper presents the redescrptions of five species of moth flies which are new to Taiwan. This brings the total to 25 species known as distributed in Taiwan.

Specimens were collected by 6-W UV light traps at night; the collection sites were in central Taiwan. The moth fly specimens were sorted and preserved in 75% alcohol. Representative specimens of each taxon were mounted on glass slides with Canada balsam using ordinary procedures.

The terminology used in this study follows that of Quate (1996). All descriptions are based on female psychodids except for *Psychoda savaiiensis*. All specimens for this study are deposited in the collection of the Department of Biology, Tunghai University.

Descriptions

Psychoda pseudominuta Wagner, 1978 (Fig. 1, (1)-(5))

Psychoda pseudominuta Wagner, 1978, *Folia Entomol. Hung.* 31: 277-287.

Female: Antenna with 16 segments, terminal 4 flagellomeres unequal in size; ascoids Y-shaped; relative length of antenna segments 1 to 7: 11-6-8.5-8.5-8.5-8-8; 13 to 16: 3.5-1-1-1 (segments 8 to 12 are atrophied). Eye bridge with 4 rows of facets; eyes separated by 2.5 facet diameters. Palpus formula : 8-11-10-12.5. Labellum with 4 long teeth.

Wing with radial and medial forks complete; $R_{2+3}-R_2-R_3-M_{1+2}-M_1-M_2 = 9.5-10-$

14-9-21.5-19.

Subgenital plate bell-like with short inner rod.

Measurements: Antenna 0.66-0.76 mm; wing length 1.36-1.64 mm, width 0.52-0.6 mm; ratio of wing length to width 2.50-2.73; palpus 0.26-0.31 mm.

Materials examined: TAICHUNG: Tunghai Univ., 4, 1-V-1996, Y. T. Huang.

Distribution: Taiwan (new record) and N. Korea.

Discussion: *Psychoda pseudominuta* is very similar to *Psychoda minuta* in male and female genitalia. Differences between *Ps. pseudominuta* and *Ps. minuta* occur in the length of the antennae and wings. The length of the antenna of *Ps. pseudominuta* is 0.66-0.76 mm; that of *Ps. minuta* is 0.8-1.1 mm (Quate, 1955). Wing length of *Ps. pseudominuta* is 1.36-1.64 mm; that of *Ps. minuta* is 1.6-2.2 mm.

Psychoda savaiiensis Edward, 1928 (Fig. 1, (6)-(13))

Psychoda savaiiensis Edward, 1928, *Insects of Samoa*, Pt. 6: 74. Duckhouse, 1973. *Mus. Zool. Univ. Sao Paulo.* 12: 1-29. - Quate, 1962a. *Pacif. Inst.* 4: 1-76. - Quate, 1962b. *Pacif. Inst.* 4: 219-234. - Quate, 1965. *Pacif. Inst.* 7: 815-902. - Quate, 1966a. *Pacif. Inst.* 8: 299-318. - Quate, 1967. *Pacif. Insects Monogr.* 15: 1-215. - Quate, 1996b. *Univ. Costa Rica* 44: 1-81.

Psychoda lucia Quate, 1954. *Proc. Hawaiian Entomol.* 15: 335-356.

Psychoda rarotongensis Satchell, 1953. *Proc. R. Ent. Soc. Lond. Ser. B.* 22: 181-188. Quate, 1955. *Univ. CA. Pub. Entomol.* 9: 103-272. -Quate, 1959. *B. P. Bishop Mus. Insects Micronesia* 12: 435-484.

Female: Antenna with 14 segments, terminal 2 flagellomeres unequal in size; ascoids Y-shaped; relative length of antenna segments: 8-5.5-8.5-8-8-8-8-9-8.2-8-7-4.5-2.2. Eye bridge with 4 rows of facets; eyes separated by 1/2 to 1 facet diameters. Palpus formula: 12-12-13-17. Labellum with 4 long teeth.

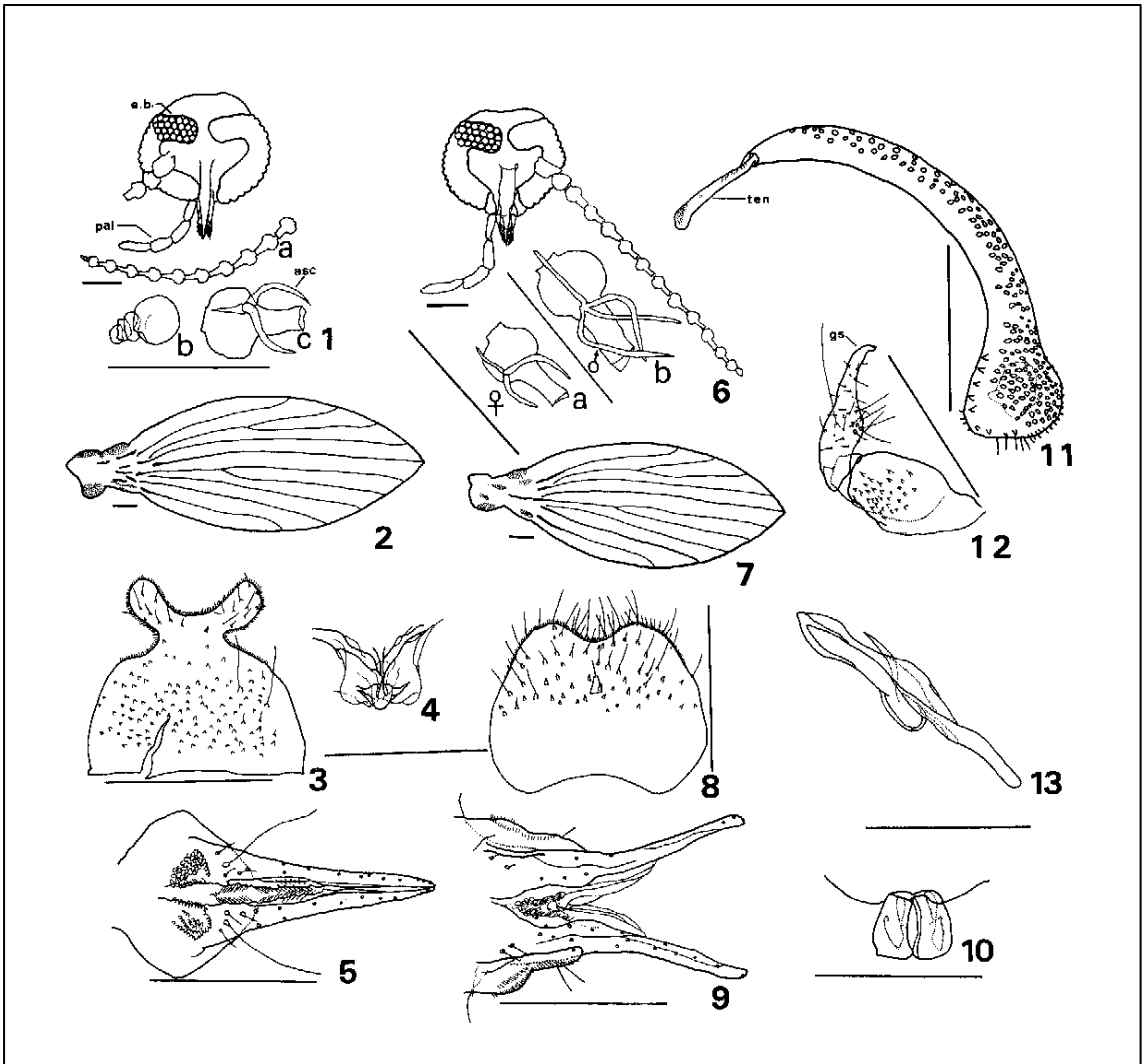


Fig. 1. 1-5. *Psychoda pseudominuta* (1) head and antenna, a. flagellomeres 2-14, b. flagellomeres 11-14, c. flagellomere and ascoids; (2) wing; (3) subgenital plate; (4) spermatheca; (5) cercus. 6-13. *Psychoda savaiiensis*, (6) head and antenna, a. female flagellomere and ascoids, b. male flagellomere and ascoids; (7) wing; (8) subgenital plate; (9) cercus; (10) spermatheca; (11) surstylus; (12) gonopod; (13) aedeagus. e. b. = eye bridge, pal = palpus, asc = ascoids, ten = tenaculum, gs = gonostylus, Scale bar = 0.1 mm.

Wing with radial and medial forks complete, but R_3 a little separated from R_2 ; R_{2+3} - R_2 - R_3 - M_{1+2} - M_1 - M_2 = 12-13.5-19-11.5-24-23.

Subgenital plate peachlike with short inner rod.

Measurements: Antenna 0.65-0.85 mm; wing length 1.13-1.52 mm, width

0.45-0.62 mm; ratio of wing length to width 2.35-2.71; palpus 0.23-0.36 mm.

Male: Antenna with 14 flagellomeres; ascoids with 4-branched shape. Eye bridge with 4 rows of facets; eyes separated by 1/2 to 1 facet diameters.

Aedeagus pikelike with small, crescentlike paramere; surstylus slender

and curved with single long tenaculum; gonopod stocky, about 1/2 length of surstylus.

Measurements: Antenna 0.86-1.14 mm; wing length 0.98-1.36 mm, width 0.41-0.56 mm; ratio of wing length to width 2.21-2.95; palpus 0.25-0.37 mm.

Materials examined: MIAOLI: Danan Tsuen, 1 ♂, 4-VII-1996, Y. T. Huang. NANTOU: Huisun, 1 ♂, 3-IX-1997, Y. T. Huang. TAICHUNG: Guguan, 1 ♂, 24-X-1994, Y. T. Huang; Tunghai Univ., 21 ♀, 13-X-1995, Y. T. Huang; 105 ♂, 1-V-1996, Y. T. Huang; 6 ♀, 10-V-1996, Y. T. Huang; 78 ♀, 19-VIII-1999, Y. T. Huang; Wushihkeng, 1 ♀, 8-X-1997, S. C. Lin.

Distribution: Taiwan (new record), USA, Borneo, Costa Rica, Japan, Malaysia, Micronesia, New Britain, New Guinea, Nicaragua, Panama, the Philippines, Ryukyu (Japan), and Samoa.

Discussion: This moth fly is a cosmopolitan and dominant species in Taiwan. Duckhouse (1973) listed Taiwan as one of the distribution areas of *Ps. savaiiensis* without any collection data, which were found neither in the later papers of Huang and Chen (1992) nor in that of Lin and Chen (1999). It is widely distributed in Taiwan, but since there were no previous collection data, it is treated as a new record species.

Psychoda trilobata Tokunaga, 1957 (Fig. 2, (1)-(5))

Psychoda trilobata Tokunaga, 1957b, Philip. J. Sci. 86: 359-403. Quate, 1962a. Pacif. Inst. 4: 1-76.

Female: Antenna with 16 segments, terminal 4 flagellomeres unequal in size; ascoids 3-branched; relative length of antenna segments: 7-5.5-9.5-9.5-9-9-9-9-8.2-8-8-7-3.5-1-1.2-1.2. Eye bridge with 4 rows of facets; eyes separated by 1 to 2 facet diameters. Palpus formula: 15-17.5-15.5-20. Labellum with 3 teeth and 2 setae.

Wing with radial and medial forks complete, but R_3 a little separated from R_2 ;

$R_{2+3}-R_2-R_3-M_{1+2}-M_1-M_2 = 21.5-22-30-16-41-37$.

Subgenital plate with big para-plate, inner rod short, cercus shorter than in other *Psychoda* species.

Measurements: Antenna 0.84 mm; wing length 1.12-1.92 mm, width 0.44-0.70 mm; ratio of wing length to width 2.25-2.55; palpus 0.25-0.34 mm.

Materials examined: NANTOU: N. Dungyenshan, 1 ♀, 16-III-1996, L. P. Hsu; TAICHUNG: Tunghai Univ., 1 ♀, 17-VII-1987, I. C. Liou; 2 ♀, 1-V-1996, Y. T. Huang.

Distribution: Taiwan (new record), Borneo and Japan.

Discussion: The female subgenital plate of *Ps. trilobata* is similar to those of *Ps. harrisi* and *Ps. subquadribata*. Antennae of *Ps. trilobata* and *Ps. harrisi* have 16 segments while those of *Ps. subquadribata* have only 15. The first, second, and third segments of the palpus of *Ps. trilobata* are the same length; the first palpal segment of both *Ps. harrisi* and *Ps. subquadribata* is shorter than the other segments.

Telmatoscopus rivularis Quate, 1962 (Fig. 2, (6)-(9))

Telmatoscopus rivularis Quate, 1962a, Pacif. Inst. 4: 1-76.

Female: Antenna segment number unknown; ascoids composed of a single sinuate branch (Quate, 1962a); relative length of antenna segments 1 to 4: 22-14-13-11.5. Eye bridge with 4 rows of facets; eyes separated by 3 to 4 facet diameters. Palpus formula: 8.5-12-13-18.5. Labellum bulbous, without teeth.

Wing with radial and medial forks complete; $R_{2+3}-R_2-R_3-M_{1+2}-M_1-M_2 = 7.0-23.0-29.0-9.5-21.0-23.0$.

Subgenital plate as figured; spermatheca structured out of a thick membrane.

Measurements: Wing length 1.72 mm, width 0.62 mm; ratio of wing length to width 1.38; palpus 0.42 mm.

Material examined: TAICHUNG: Tunghai Univ., 1 ♀, 1-V-1996, Y. T. Huang.

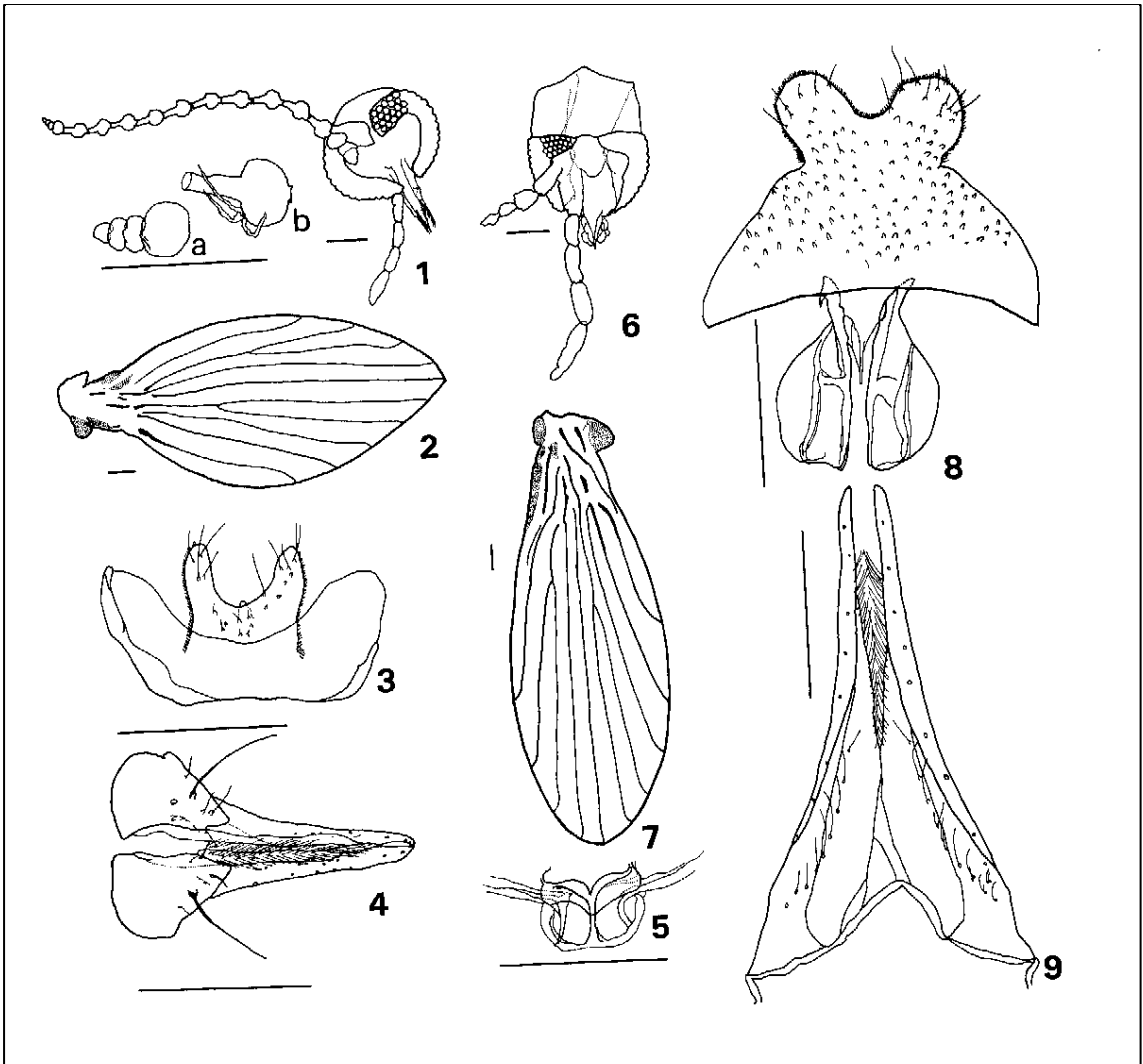


Fig. 2. 1-5. *Psychoda trilobata* (1) head and antenna, a. flagellomeres 11-14, b. flagellomere and ascoids; (2) wing; (3) subgenital plate; (4) cercus; (5) spermatheca. 6-9. *Telmatoscopus rivularis*, (6) head; (7) wing; (8) subgenital plate and spermatheca; (9) cercus. Scale bar = 0.1 mm.

Distribution: Taiwan (new record) and Borneo.

Discussion: Quate (1962a) examined 11 males and 17 females and published it as the new species, *Telmatoscopus rivularis*, but he did not describe the number of segments of the antennae. We found only a single specimen of *Telmatoscopus rivularis* on the Tunghai University campus; the

antenna of this specimen was broken after the 4th segment.

Trichopsychoda coreanica Wagner, 1978 (Fig. 3, (1)-(6))

Trichopsychoda coreanica Wagner, 1978, Folia Entomol. Hung. 31: 277-287.

Female: Antenna with 16 segments, terminal 4 flagellomeres without inter-

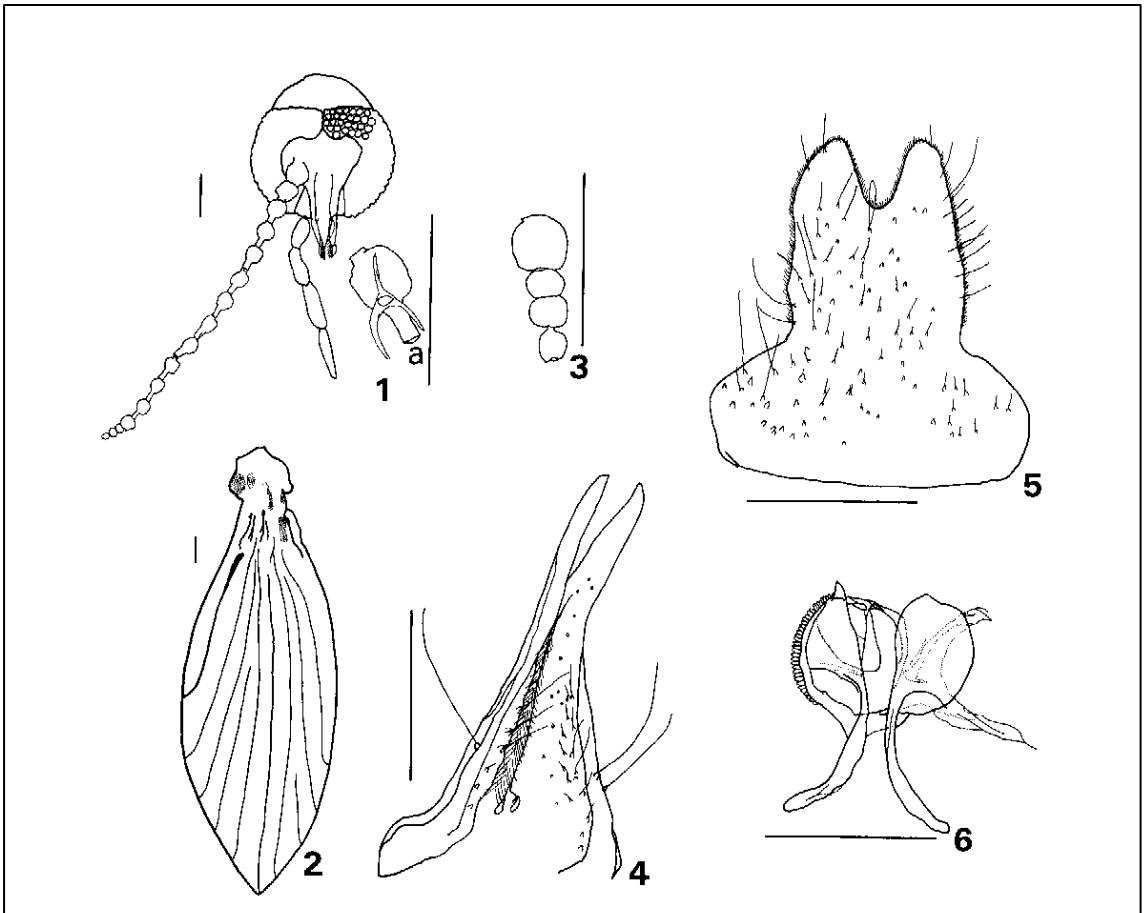


Fig. 3. *Trichopsychoda coreanica*, (1) head and antenna, a. flagellomeres 11-14, b. flagellomere and ascoids; (2) wing; (3) distal segments of antenna; (4) cercus; (5) subgenital plate; (6) spermatheca. Scale bar = 0.1 mm.

nodes; ascoids with 3-branched shape; relative length of antenna segments: 8-6-9-8-8-8.5-8.5-8-8-8-7-3-1-1-2.5. Eye bridge with 4 rows of facets; eyes separated by 1/2 facet diameters. Palpus formula: 10-13-16-17. Labellum bulbouslike, with long setae and vestiges of teeth.

Wing with radial fork incomplete, medial fork complete, but M_2 a little separated from M_1 ; R_{2+3} - R_2 - R_3 - M_{1+2} - M_1 - M_2 = 33-10-15.3-17-27.3-24. Subgenital plate T-shaped, apical lobes sharp, without inner rod, spermatheca larger than in other species.

Measurements: Antenna 0.74-0.82

mm; palpus 0.40-0.48 mm; wing length 1.62-1.99 mm, width 0.58-0.73 mm; ratio of wing length to width 2.69-2.89.

Materials examined: TAICHUNG: Guguan, 2, 24-X-1994, Y. T. Huang; Tunghai Univ., 1, 13-X-1995, Y. T. Huang; 2, 1-V-1996, Y. T. Huang; 9, 19-VIII-1999, Y. T. Huang.

Distribution: Taiwan (new record) and N. Korea.

Discussion: Plump, curved, branched dististyle (Wagner, 1978) and T-shaped subgenital plate are the distinguishing characters of *Trichopsychoda coreanica*.

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臺灣產五種蛾蚋科(雙翅目)昆蟲的重新描述

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摘 要

本文描述台灣地區蛾蚋科昆蟲五個種，這五個種均為台灣地區的新記錄種；分別是蛾蚋屬的 *Psychoda pseudominuta*, *Ps. savaiiensis*, *Ps. trilobata*，池畔蛾蚋屬的 *Telmatoscopus rivularis* 和多毛蛾蚋屬的 *Trichopsychoda coreanica*；其中多毛蛾蚋屬為台灣地區新記錄屬。所有的標本均採集自台灣中部地區。

關鍵詞：蛾蚋科、新記錄屬、新記錄種、分類、台灣。