

New Dolichopodinae (Diptera: Dolichopodidae) from Pulau Tioman, Malaysia, with description of four new species

by Lili ZHANG, Ding YANG & Patrick GROOTAERT

Abstract

Four new Dolichopodinae are described and illustrated from Pulau Tioman, Malaysia: *Hercostomus tiomanensis* sp. nov., *Hercostomus bidentatus* sp. nov., *Paraclius longus* sp. nov. and *Tachytrechus basiserratus* sp. nov.

Key words: Diptera, Dolichopodidae, *Hercostomus*, *Paraclius*, *Tachytrechus*, new species, Malaysia.

Introduction

Pulau Tioman is a small island at about 40 km east of Peninsular Malaysia in the South China Sea. Several faunal inventories have been made recently mainly conducted by the staff of the Raffles Museum of Biodiversity Research. It resulted in a monograph on the fauna and flora of Pulau Tioman. (Ng *et al.*, 1999). In that work a description of the island is given with maps, river system and miscellaneous papers on fauna and flora.

A lot of attention was paid during the last years to the Oriental Dolichopodinae of China (Yang *et al.*, 2007), but little recent research was done on Southeast Asian Dolichopodinae. Nevertheless, the fauna of Southeast Asia also proves to be very rich and different of that of Oriental China as proved by a paper on *Paraclius* from Singapore (Zhang *et al.*, 2007). In that study seven new species are described from mangrove. In the present study mangroves and other marine habitats were sampled, as well as some terrestrial sites. It resulted in the discovery of four new species, none of them recorded from South China or Singapore so far.

Material and methods

The material was collected during a field trip of

the biology students of the National University of Singapore. All material was collected by sweep netting. Holotypes and most paratypes are conserved in the collections of the Royal Belgian Institute of Natural Sciences in Brussels (RBINS) and some paratypes are conserved in the Institute of Zoology, Academy of Sciences in Beijing (IOZ).

The following abbreviations are used: acr-acrostichal, ad-anterodorsal, av-anteroventral, dc-dorsocentral, LI-fore leg, LII-mid leg, LIII-hind leg, pd-posterodorsal, pv-posteroventral, v-ventral.

Taxonomic account

Hercostomus tiomanensis sp. nov.

(Figs 1-4)

MATERIAL EXAMINED: HOLOTYPE – male, MALAYSIA, Pulau Tioman, Paya, 21 July 2005, small mangrove on island in front of Paya (reg. 25252, leg. P. Grootaert, Tio95, RBINS).

PARATYPES – 1 female, same provenance as holotype. 1 male, Pulau Tioman, Monkey Bay (near Salang), 17 July 2005, sandy beach with rocks (reg. 25226, Tio27, leg. P. Grootaert, IOZ).

DIAGNOSIS: Postocular bristles and posteroventral hairs black; antenna dark brown, first flagellomere as long as wide. Fore coxa yellow, mid and hind coxae blackish. Epandrium distinctly elongated, cercus triangular, with narrow ventral apex, aedeagus with 1 denticle near the apex.

DESCRIPTION: Male - Body length 2.6-2.7 mm, wing length 2.4-2.6 mm.

Head metallic green with pale grey pollen. Face

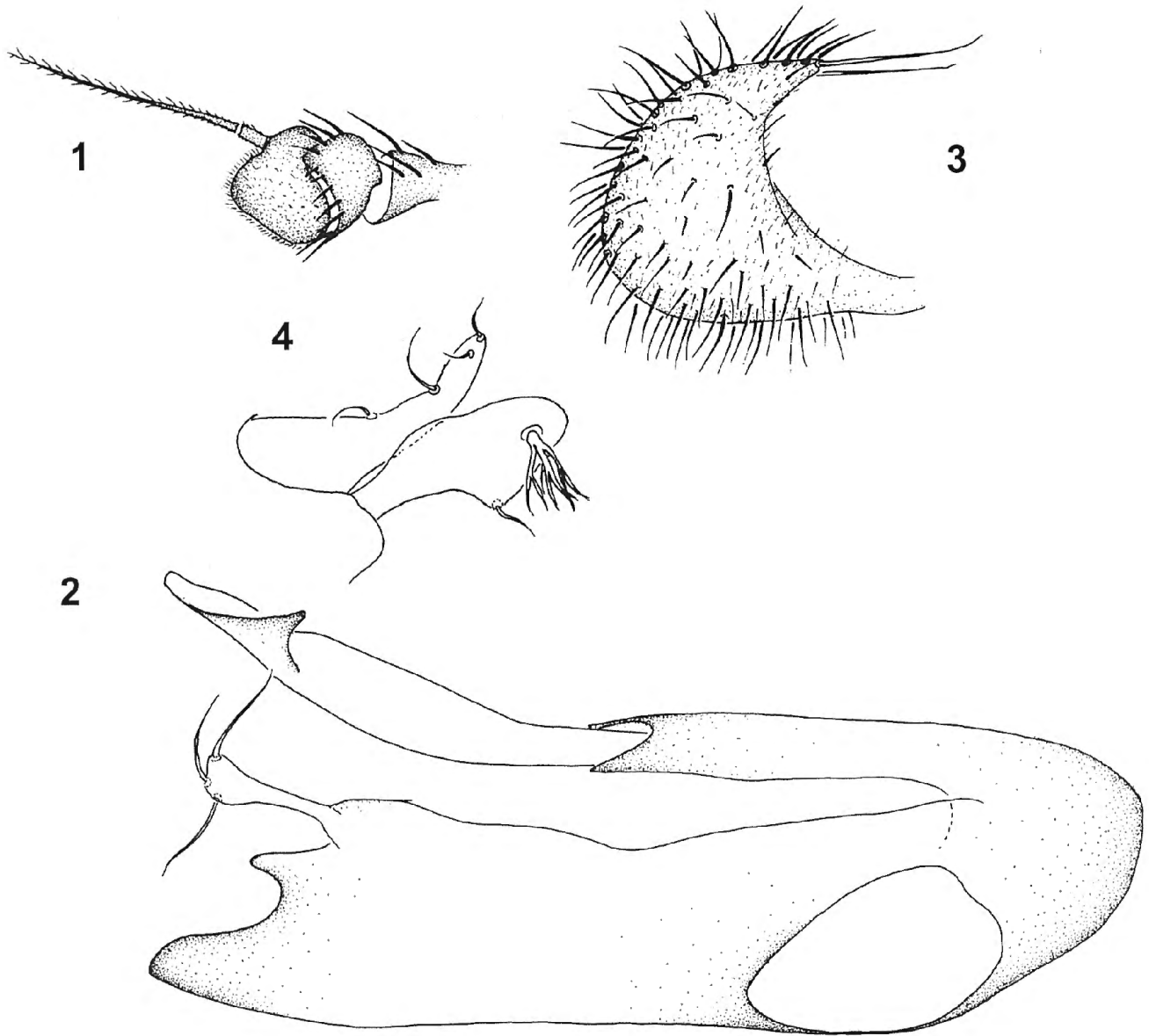


Fig. 1-4 — *Hercostomus tiomanensis* sp. nov. 1. antenna, 2. male genitalia, 3. cercus, 4. surstyli.

narrowing downward, narrower than first flagellomere. Hairs and bristles black. Postocular bristles and posteroventral hairs black. Antenna (Fig. 1) dark brown, except basal ventral area of first flagellomere brownish yellow; first flagellomere small, as long as wide, arista dorsal, with very short basal segment. Proboscis brownish yellow with black hairs, palpus brownish yellow with black hairs and 1 black apical bristle.

Thorax metallic green with pale grey pollen. Hairs and bristles black. 6 strong dc, 5-6 paired acr; scutellum with two pairs of bristles (basal pair short and hair-like). Propleuron black haired with with 1 long black bristle at the lower part. Legs yellow, fore coxa yellow, mid and hind coxae blackish with yellow apex. Mid and hind tarsi from tip of tarsomere 1 onward blackish. Hairs and bristles black. Mid and hind coxae each with 1 outer

bristle. Mid and hind femora each with 1 preapical bristle. Fore tibia with 1 ad, 2 pd and 1 weak pv, apically with 3 short bristles; mid tibia with 3 ad, 2 pd and 1 av, apically with 5 bristles; hind tibia with 3 ad, 3 pd, 2 v and 1 apical d, apically with 2 bristles. Relative lengths of tibia and 5 tarsomeres LI 1.0 : 0.5 : 0.2 : 0.15 : 0.1 : 0.15; LII 1.5 : 0.65 : 0.25 : 0.2 : 0.15 : 0.15; LIII 1.75 : 0.5 : 0.6 : 0.45 : 0.25 : 0.25. Wing (Fig. 2) hyaline, veins brown; R_{4+5} and M straight and parallel. CuAx ratio 0.77. Squama yellow with black hairs. Halter yellow.

Abdomen metallic green with pale grey pollen. Hairs and bristles black. Male genitalia (Figs 2-4): Epandrium distinctly elongated, much longer than wide; lateral lobe slightly swollen apically, with 3 apical bristles; cercus nearly triangular, clear yellow with pale bristles. Hypandrium thick and straight; aedeagus with

1 denticle near the apex.

Female: Body length 2.9 mm, wing length 2.6 mm. Similar to Male.

DISTRIBUTION: Malaysia.

ETYMOLOGY: The specific name refers to the type locality Tioman Island.

***Hercostomus bidentatus* sp. nov.**

(Figs 5-9)

MATERIAL EXAMINED: HOLOTYPE – male, MALAYSIA, Pulau Tioman, Paya, 18 July 2005, sandy beach along creek, (reg. 25231, leg. P. Grootaert, Tio58, RBINS).

PARATYPES: 5 males, 7 females of same provenance as holotype (2 males and 2 females in IOZ).

DIAGNOSIS: Postocular bristles pale except 2 uppermost bristles black. First flagellomere black, 1.3 times longer than wide. Mid tarsi thinned except tarsomeres 4-5 flattened and black (except the base of tarsomere 4). Squama yellow with pale hairs. Aedeagus with 2 indistinct inner denticles.

DESCRIPTION: Male - Body length 3.8-3.9 mm, wing length 3.1-3.2 mm.

Head metallic green with pale grey pollen. Face narrowing downward, nearly as wide as first flagellomere. Hairs and bristles black. Postocular bristles pale except the 2 uppermost bristles black, posteroventral hairs pale. Antennal (Fig. 5) scape dark yellow with narrow black dorsal, pedicel brown, first flagellomere black, 1.3 times longer than wide; arista black, minutely pubescent with basal segment 0.4 times as long as apical segment. Proboscis brownish yellow with black hairs, palpus dark yellow with black hairs and black apical bristle.

Thorax metallic green with pale grey pollen. Hairs and bristles black. 6 strong dc (5th distinctly divergent from the dc row), 6 paired acr, short and hair-like; scutellum with 2 pairs of bristles (basal pair short and hair-like). Propleuron pale haired, with 1 black bristle at the lower part. Legs yellow, fore coxa yellow with blackish base, mid and hind coxae tinged with blackish with yellow apex. Fore tarsomeres 3-5 tinged with brownish, mid tarsi thinned except tarsomeres 4-5 flattened and black (except the base of tarsomere 4), hind tarsi from tip of tarsomere 3 onward black. Hairs and bristles black. Mid and hind coxae each with 1 outer bristle. Mid and hind femora each with 1

preapical bristle. Fore tibia with 3 ad, 2 pd and 1 weak pv; mid tibia with 4 ad, 2 pad and 2 av, apically with 3 bristles; hind tibia with 6 ad, 5 pd and 3 av, apically with 3 bristles. Hind tarsomere 1 with 1-2 v. Relative lengths of tibia and 5 tarsomeres LI 1.2 : 0.5 : 0.2 : 0.13 : 0.13 : 0.15; LII 1.65 : 1.0 : 0.78 : 0.65 : 0.25 : 0.25; LIII 2.15 : 0.75 : 1.1 : 0.8 : 0.4 : 0.26. Wing (Fig. 6) hyaline, veins brown, R_{4+5} and M convergent apically; CuAx ratio 0.7. Squama yellow with pale hairs. Halter yellow.

Abdomen metallic green with pale grey pollen. Hairs and bristles black. Male genitalia (Figs 7-9): Epandrium longer than wide, lateral lobe with 2 short finger-like process bearing two apical bristles; cercus yellow, with marginal processes and pale bristles; aedeagus slender; hypandrium thick, with 2 indistinct inner denticles.

Female: Body length 3.8-3.9 mm, wing length 3.4-3.5 mm. Similar to male, except mid tarsi normal.

DISTRIBUTION: Malaysia (Pulau Tioman Is.).

ETYMOLOGY: The specific name refers to the aedeagus with two indistinct inner denticles.

***Paraclius longus* sp. nov.**

(Figs 10-13)

MATERIAL EXAMINED: HOLOTYPE – male, MALAYSIA, Pulau Tioman, Salang, 15 July 2005, near well in secondary rain forest (reg. 25222, leg. P. Grootaert, Tio47, RBINS).

PARATYPES: 1 male, same provenance as holotype (IOZ).

DIAGNOSIS: Mid and lower postocular bristles pale except the last one black and strong. Antenna brownish yellow, first flagellomere as long as wide. Legs yellow, all coxae yellow. Hind femur with black dorsal margin and with 2 preapical bristles.

DESCRIPTION: Male - Body length 4.7-5.2 mm, wing length 3.9-4.2 mm.

Head metallic green with pale grey pollen. Face narrowing downward, narrower than first flagellomere. Hairs and bristles black. Mid and lower postocular bristles (including posteroventral hairs) pale except the last one black and strong. Antenna (Fig. 10) brownish yellow, first flagellomere as long as wide, obtuse apically; arista brown, short pubescent, with short basal segment. Proboscis brownish with black hairs, palpus brownish with black hairs and black apical bristle.

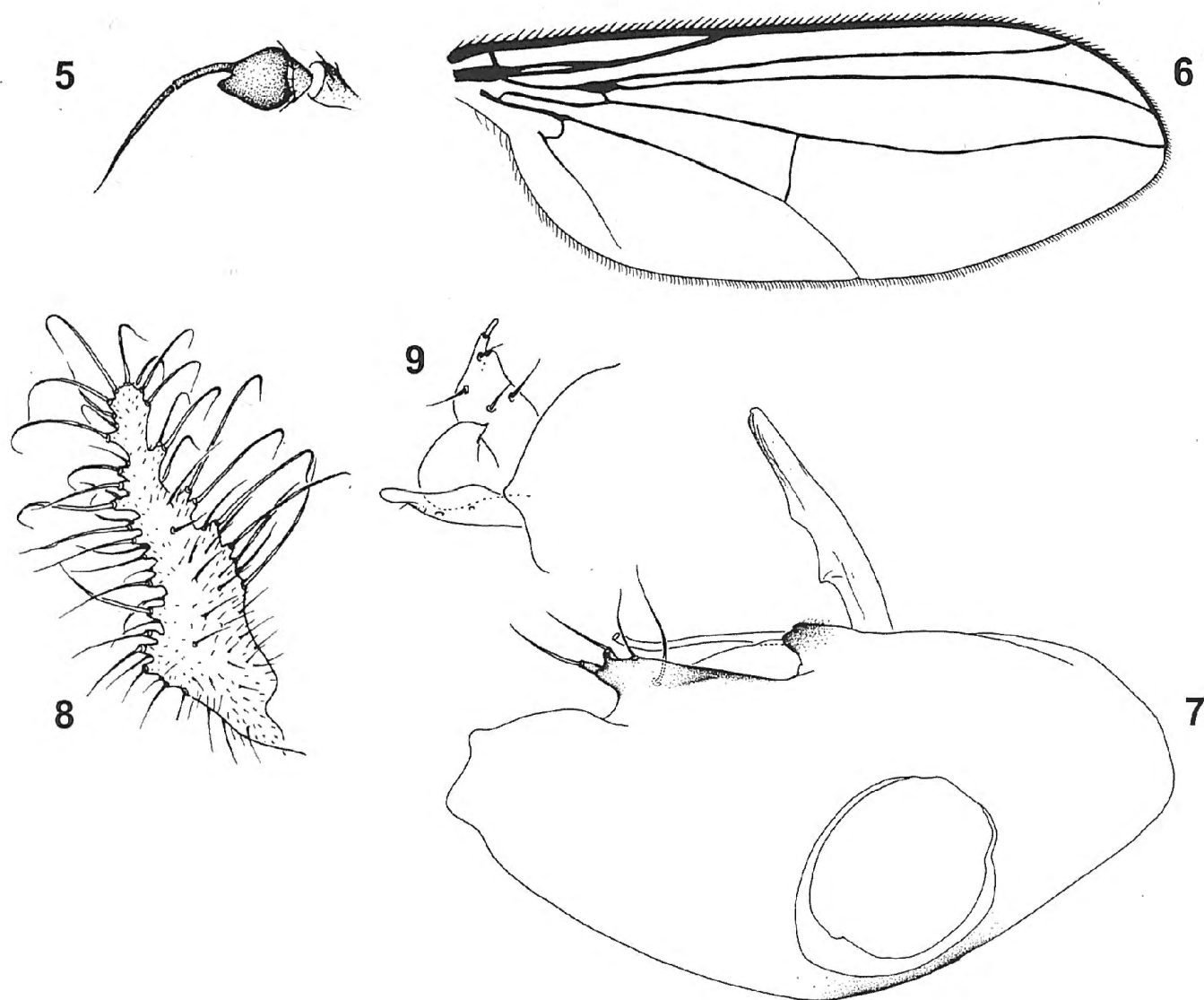


Fig. 5-9 — *Hercostomus bidentatus* sp. nov. 5. antenna, 6. wing, 7. male genitalia, 8. cercus, 9. surstyli.

Thorax metallic green with pale grey pollen. Hairs and bristles black. 5 strong dc, 7-8 paired acr; scutellum with 2 pairs of bristles (basal pair short and weak). Propleuron black haired with 1 black bristle on lower part. Legs yellow, all coxae yellow, mid coxa with 1 brownish outer spot. Hind femur with black dorsal margin. Fore and mid tarsi from tip of tarsomere 1 onward brownish, hind tarsi blackish to black. Hairs and bristles black. Mid and hind coxae each with 1 outer bristle. Mid femur with 1 preapical bristle, hind femur with 2 preapical bristles. Fore tibia with 3 ad and 2 pd; mid tibia with 4 ad, 4d, 5 pd, 3 av and 2 pv, apically with 4 bristles; hind tibia with 5 ad and 5 pd, apically with 2 bristles. Hind tarsomere 1 with 1 v at base. Relative lengths of tibia and 5 tarsomeres LI 1.65 : 1.0 : 0.38 : 0.25 : 0.24 : 0.24; LII 2.5 : 1.25 : 0.9 : 0.8 : 0.5 : 0.2;

LIII 3.0 : 1.0 : 1.35 : 1.0 : 0.5 : 0.35. Wing (Fig. 11) hyaline, tinged with greyish, veins black; R_{4+5} and M distinctly convergent, CuAx ratio 0.75. Squama yellow with black hairs. Halter yellow.

Abdomen metallic green with pale grey pollen. Hairs and bristles black. Male genitalia (Figs 12-13): Epandrium slightly longer than wide; lateral lobe finger-like, with 2 bristles; cercus elongated, bearing long bristles; aedeagus thin, slightly swollen and curved apically; hypandrium thick and straight.

Female: Unknown.

DISTRIBUTION: Malaysia.

ETYMOLOGY: The specific name refers to the elongated cercus.

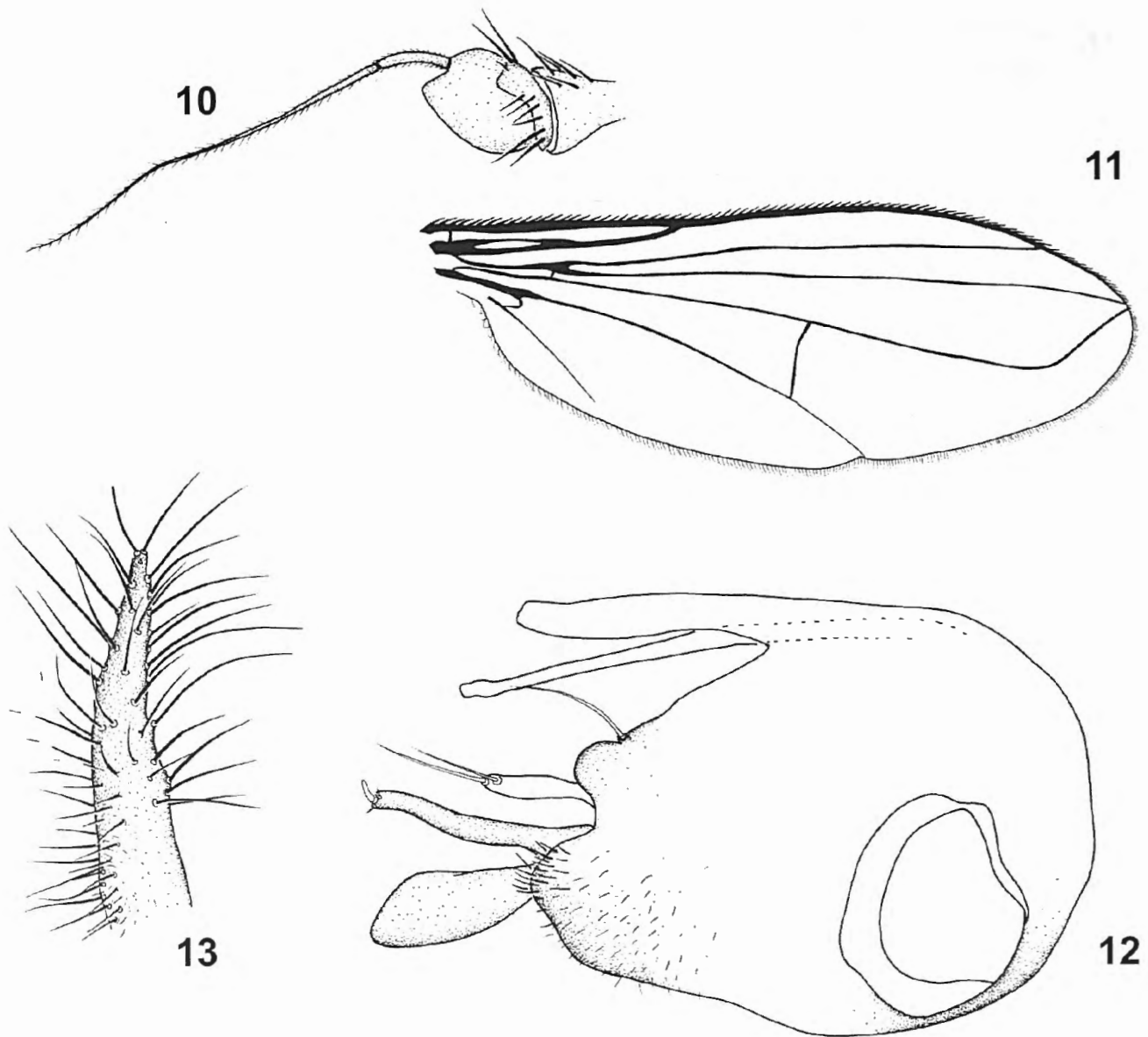


Fig. 10-13 — *Paraclius longus* sp. nov. 10. antenna, 11. wing, 12. male genitalia and surstyli, 13. cercus.

***Tachytrechus basiserratus* sp. nov.**

(Figs 14-18)

MATERIAL EXAMINED: HOLOTYPE – male, MALAYSIA, Pulau Tioman, Paya, 19 July 2005, on sand bank in stream in secondary rain forest (reg. 25239, leg. P. Grootaert, Tio38, RBINS).

PARATYPES: 1 male, same provenance as holotype (IOZ).

DIAGNOSIS: Mid and lower postocular bristles pale. Antenna black, first flagellomere as long as wide. Legs black, all coxae black, femora black except the apical 1/3 of fore and mid femora yellow. Apex of hind tibia and hind tarsi black. Cercus somewhat triangular, with

obtuse ventral apex; hypandrium with small denticles near base.

DESCRIPTION: Male - Body length 5.0-5.3 mm, wing length 4.1-4.2 mm.

Head metallic green with pale grey pollen. Face with grey brown pollen, slightly wider than first flagellomere. Hairs and bristles black. Mid and lower postocular bristles (including the posteroventral hair) pale. Antenna (Fig. 14) black except the apex of scape brownish, first flagellomere as long as wide, obtuse apically; arista black, nearly bare with very short basal segment. Proboscis black with black hairs, palpus black with black hairs and black apical bristle.

Thorax metallic green with pale grey pollen. 6 strong dc, 8 paired acr short and hair-like; scutellum

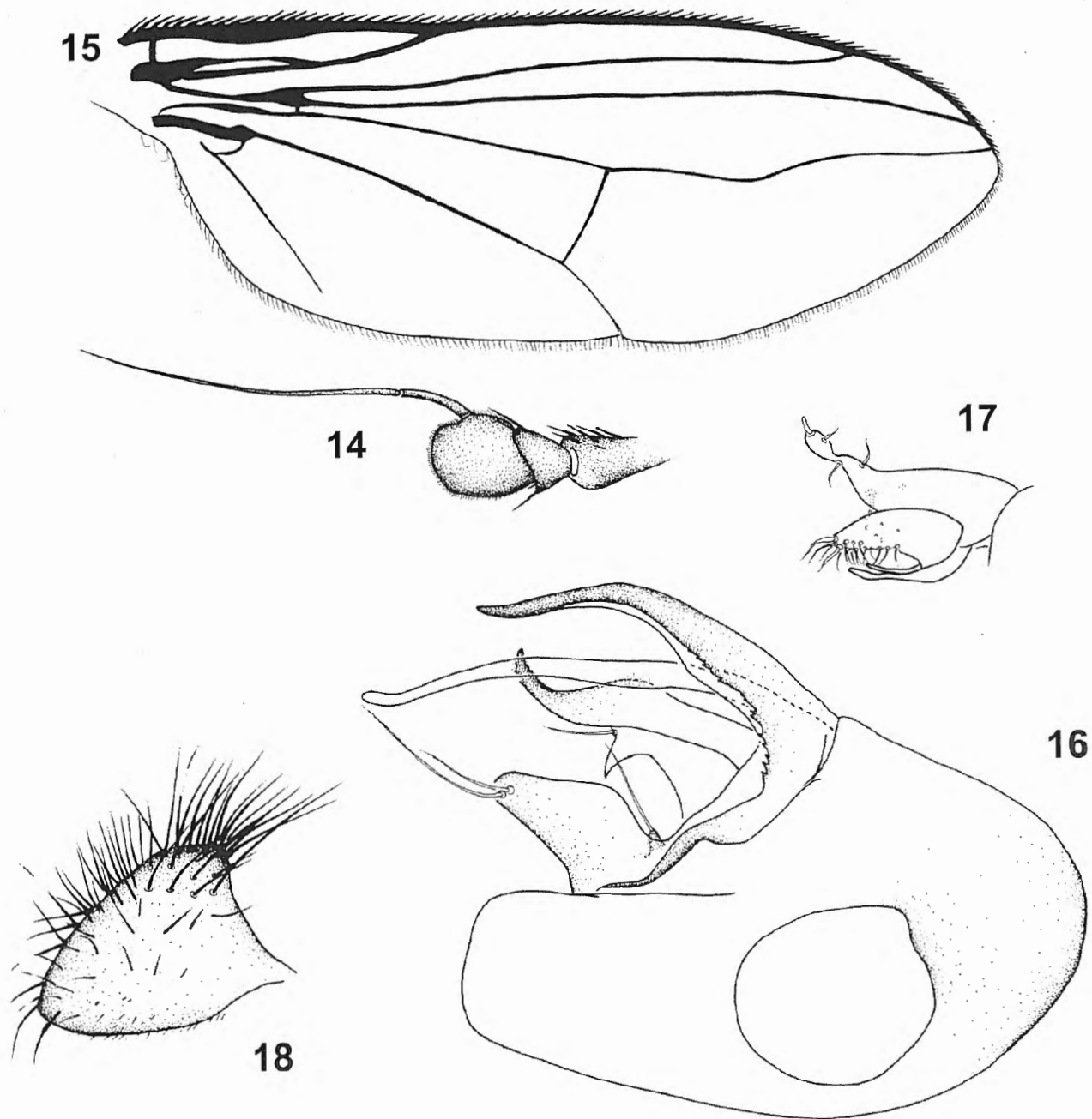


Fig. 14-18 — *Tachytrechus basiserratus* sp. nov. 14. antenna, 15. wing, 16. male genitalia, 17. cercus, 18. surstyli.

with 2 pairs of bristles (basal pair short and weak). Propleuron black haired with 1 black bristle at lower part. Legs black, all coxae black with brownish apex. Femora black except the apical 1/3-1/4 of fore and mid femora yellow; trochanters blackish; apex of fore and mid tibia blackish; fore and mid tarsi from apex of tarsomere 1 onward black; apex of hind tibia and hind tarsi black. Hairs and bristles black. Mid femur with 1 preapical bristle, hind femur with 4 dorsal bristles except the preapical one. Fore tibia with 4 ad and 2 pd; mid tibia with 5 ad, 3 pd and 1 pv, apically with 4 bristles; hind tibia with 5 ad, 5 pd, 1 av and 5 thin v,

apically with 3 bristles. Hind tarsomere 1 with 1 v at base. Relative lengths of tibia and 5 tarsomeres LI 1.75 : 1.0 : 0.25 : 0.25 : 0.2 : 0.25; LII 2.7 : 1.3 : 0.6 : 0.5 : 0.4 : 0.45; LIII 3.2 : 1.0 : 1.0 : 0.7 : 0.5 : 0.45. Wing (Fig. 15) hyaline, veins black; R_{4+5} and M convergent apically, CuAx ratio 1.1. Squama yellow with black hairs. Halter pale yellow.

Abdomen metallic green with pale grey pollen. Hairs and bristles black. Male genitalia (Figs 16-18): Epandrium longer than wide, lateral lobe broad, with 2 bristles; cercus somewhat triangular, with obtuse ventral apex; hypandrium with small denticles near

base, slender apically; aedeagus slender, slightly curved apically.

Female: Unknown.

DISTRIBUTION: Malaysia.

ETYMOLOGY: The specific name refers to the small denticles near base of the hypandrium.

REMARKS: The new species is very close to *T. crassitarsis* de Meijere, 1916 and *T. compositus* Hollis, 1964 by the hypandrium having small denticles, but may be separated by the following key:

1. Hind tarsomere 1 yellow in basal half; aedeagus furcated apically *T. compositus* HOLLIS
 - Hind tarsomere 1 wholly black; aedeagus not furcated apically 2
 2. Mid tibia without ventral bristles; fore tarsomeres 2-4 flattened laterally, as long as wide
 *T. crassitarsis* DE MEIJERE
 - Mid tibia with 1 pv; fore tarsomeres not flattened, longer than wide *T. basiserratus* sp. nov.

Acknowledgements

The third author (P.G.) thanks Prof. Dr. Peter Ng, director of Raffles Museum for Biodiversity Research, and Prof. Dr. Rudolf Meier, head of the Evolutionary Biology laboratory, for hosting him during his sabbatical stay at NUS. P. Grootaert further acknowledges a grant in the Action 4 programme of the Belgian Science Policy. The present study is partly supported by the National Natural Science Foundation of China (No. 30225009 and No. 30600056).

References

- HOLLIS, D., 1964. On the Diptera of Nepal (Stratiomyidae, Therevidae and Dolichopodidae). *Bulletin of the British Museum (Natural History) Entomology*, **15**: 81-116.
- NG, P.K.L., YOUNG, H.S. & N.S. SODHI. 1999. Biodiversity research on Pulau Tioman, Peninsular Malaysia: a historical perspective. *The Raffles Bulletin of Zoology*, Supplement No. 6: 5-10
- YANG D., Y. J. ZHU, M. Q. WANG & L. ZHANG, 2006. *World catalog of Dolichopodidae (Insecta: Diptera)*. China Agricultural University Press, Beijing. 704 pp.
- ZHANG L., D. YANG & P. GROOTAERT, 2007. *Paraclius* (Diptera: Dolichopodidae: Dolichopodinae) of Singapore, with new species from mangroves. *The Raffles of Bulletin of Zoology*, **55**: 49-62.

Lili Zhang
 Institute of Zoology
 Chinese Academy of Sciences
 Beijing 100080, China

Ding Yang
 Department of Entomology
 China Agricultural University
 Beijing 100094, China

Patrick Grootaert
 Department of Entomology
 Royal Belgian Institute of Natural Sciences
 Vautierstraat 29
 B-1000 Brussels, Belgium

