THE RAFFLES BULLETIN OF ZOOLOGY 2004 **52**(1): 29-36

STEGANA (OXYPHORTICA) NIGRIPENNIS SPECIES-GROUP, WITH DESCRIPTIONS OF FOUR NEW SPECIES FROM SOUTHEAST ASIA (INSECTA: DIPTERA: DROSOPHILIDAE)

Hong-wei Chen

Department of Biology, Shenyang Normal University, Huanggu, Shenyang, 110034 China
Department of Entomology, South China Agriculture University, Wushan, Tianhe, Guangzhou, 510642 China
Email: hongweic@scau.edu.cn

Bao-cheng Wang

Laboratory of Molecular Evolution and Genome Diversity, Kunming Institute of Zoology, Chinese Academy of Sciences, 32nd Jiaochang Donglu, Kunming, 650223 China

ABSTRACT. – The *nigripennis* species-group is established within the subgenus *Stegana* (*Oxyphortica*), consisting of five species distributed in the Oriental Region, *Stegana* (*O.*) *nigripennis* (Hendel) from southern Japan, *S.* (*O.*) *aotsukai*, new species and *S.* (*O.*) *prigenti*, new species from southern China and Thailand, and *S.* (*O.*) *trisetosa*, new species and *S.* (*O.*) *yapingi*, new species, from eastern Malaysia. A key to all the species in this group is provided.

KEY WORDS. – Drosophilidae, *Stegana*, *nigripennis* species-group, new species, Oriental Region.

INTRODUCTION

The subgenus *Oxyphortica* was originally established in the genus *Phortica* Schiner (1862) by Duda (1923), and later moved to the genus *Stegana* by Okada (1971), and included eleven species all from the Oriental Region (Wheeler, 1981; Toda & Peng, 1992; Chen & Toda, 1994; Sidorenko, 1998). *Stegana* (*Oxyphortica*) is most similar to subgenus *Stegana* (*Orthostegana*) Hendel, 1913 (Okada, 1978; Sidorenko, 1998), which has only two species: *acutangula* (Hendel, 1913) from Nicaragua to Bolivia, and *curvinervis* (Hendel, 1914) from Taiwan. Only two minor diagnostic characters distinguish them: the distal part of M_{1+2} is curved forward weakly in *Oxyphortica* and strongly in *Orthostegana*, and the proximal end of the mid-tibia has either two (*Oxyphortica*) or three (*Orthostegana*) long, strong posterodorsal setae. We report four new *Stegana* species in the present study, all of which closely resemble *Stegana* (*Oxyphortica*) *nigripennis* (Hendel, 1914) from Taiwan, a species originally placed in *Orthostegana* but subsequently moved to subgenus *Oxyphortica*. Three of the four new species, however, have mid-tibia setation characteristic of *Orthostegana*. The subgeneric classification for these species is thus, once again, brought into question by these discoveries. Comprehensive revision of the genus *Stegana* at the subgeneric level is required but is beyond the scope of the present work. We are confident about the erection of a new species-group to accommodate the four new species and *S. nigripennis* but we are tentative about placing this group in the subgenus *Oxyphortica*.

In the present paper, the specimens examined were collected from tree trunks near forest stream (Figs. 1, 2). The type specimens will be deposited in the following institutions: Forest Research Center, Kuching, Sarawak, Malaysia (FRC); Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia (ITBC); Kunming Institute of Zoology, Chinese Academy of Sciences,

Fig. 1. Landscape of the collection locality of *Stegana* (*Oxyphortica*) *nigripennis* (Hendel), arrow indicates position of an individual of *Stegana (Oxyphortica) nigripennis (Hendel).*

Kunming, China (KIZ); Kinabalu Park, Sabah Parks, Sabah, Malaysia (KPSP); National Museum of Natural History, Paris France (NMNH); Systematic Entomology, The Hokkaido University Museum, Hokkaido University, Sapporo, Japan (SEHU) and Department of Entomology, South China Agriculture University, Guangzhou, China (SCAU).

TAXONOMY

Stegana (*Oxyphortica*) Duda, 1923

Oxyphortica Duda, 1923: 34 (as subgenus of *Phortica*).

Type species: *Drosophila convergens* de Meijere, 1911.

Diagnosis. – M_{1+2} distally curved forward weakly.

Included species. – *Stegana (Oxyphortica) adentata* Toda & Peng, 1992 (Southern China); *S. (O.) burmensis* Sidorenko, 1997 (Myanmar); *S. (O.) convergens* (de Meijere, 1911) (Taiwan, Viet Nam, Borneo, Java, New Guinea); *S. (O.) enigma* Sidorenko, 1998 (Viet Nam); *S. (O.) maichouensis* Sidorenko, 1998 (Viet Nam); *S. (O.) meichiensis* Chen & Toda, 1994 (Southern China); *S. (O.) nigripennis* (Hendel, 1914) (Japan, Taiwan); *S. (O.) pyinoolwinensis* Sidorenko, 1997 (Myanmar); *S. (O.) setifrons* Sidorenko, 1997 (China); *S. (O.) subconvergens* Okada, 1988 (Sri Lanka); and *S. (O.) watabei* Sidorenko, 1998 (Indonesia).

Stegana (*Oxyphortica*) *nigripennis* species-group

Diagnosis. – Interfrontal setulae dense, thick; lunule developed, black; mesonotum and pleura yellow with 3-4 black, longitudinal stripes (Fig. 2); wing dark brown to black, pale along posterior margin, with 3-4 yellow patches: one in the r_{4+5} cell, one in the dm cell and one just beyond the latter (Fig. 2).

Description. – Head: Eyes red, with pale band medially (Fig. 2). Ocellar triangle black. Frons yellow above, black below. Fronto-orbital plate yellow. Pedicel yellow; first flagellomere yellowish to greyish yellow. Face yellow, with 1 narrow, black band in lower 1/3; facial carina low. Clypeus brown. Gena yellow. Palpus greyish yellow to brown, rod-like, with 1 prominent subapical and 1 row of moderate ventral setae. Vibrissa prominent.

Thorax: Postpronotal lobe yellow, with 1 long seta. Scutellum medially black, yellow along entire margin. Katepisternum with 3 setae, medial one shorter than the others.

Wing: Costal vein between R_{2+3} and R_{4+5} with ca. 7-8 peg-like spinules on ventral surface. R_{4+5} weakly convergent to M_1 distally.

Legs: Yellow; all femora distally and tibiae basally brown to black; mid femur with 2-3 rows of strong, anterior setae.

Abdomen: Tergites yellow anteriorly, with laterally protruded, black band on posterior margin. Sternites yellow, narrow, long.

Male terminalia: Epandrium broad, with strong setae along posterior margin, pubescent except for anterior to ventral margins. Surstylus not pubescent, several distinct setae on distal margin and inner surface. Cercus small, separated from epandrium, pubescent and setigerous. Hypandrium somewhat oblong, antero-medially and laterally contiguous to paramere. Gonopods bilobed, baso-laterally contiguous to posterior ends of hypandrium, apico-laterally contiguous to surstylus. Paramere with several small sensilla submedially. Aedeagus bifurcate, basally contiguous to arm of aedeagal apodeme. Aedeagal apodeme long, rod-shaped.

Stegana (*Oxyphortica*) *nigripennis* (Hendel, 1914)
(Fig. 2)

Orthostegana nigripennis Hendel, 1914: 115.
Chaetocnema (*Oxyphortica*) *poeciloptera* Duda, 1926: 243; synonymized by Okada, 1971: 89.
Protostegana kanoi Okada, 1956: 14; synonymized by Okada, 1968: 304.
Stegana (*Stegana*) *nigripennis* - Okada, 1968: 304.
Stegana (*Orhtostegana*) *nigripennis* - Okada, 1971: 89.
Stegana (*Oxyphortica*) *nigripennis* - Wheeler, 1981: 30; Okada, 1988: 27.

Material examined. – JAPAN: Holotype male of *Protostegana kanoi* Okada, 1956, Ishigakijima, coll. Kano, 19 Sep.1955 (NSMT); 8 males, 12 females, Uehaha, Iriomote Is., Ryukyu Is., coll. M. J. Toda & H. - w. Chen 10-21 Jun.1999 (2 males, 2 females, SEHU; 6 males, 10 females, SCAU).

Distribution. – China (Taiwan), Japan (Kyushu, Ryukyu Is.).

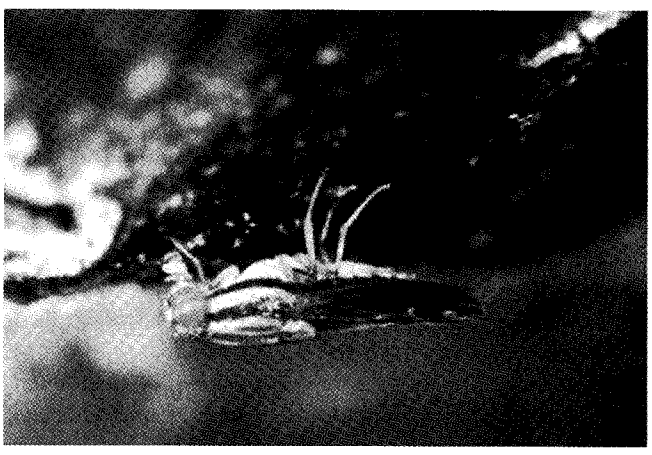


Fig. 2. *Stegana* (*Oxyphortica*) *nigripennis* (Hendel) on a tree trunk. Photographs are provided by Dr. T. Yoshida (Hokkaido University, Japan) and were taken at Iriomote Is., Ryukyu Is., Japan.

***Stegana (Oxyphortica) aotsukai*, new species**
(Figs. 3-6)

Material examined. – Holotype male, CHINA: Mt. Wuyi, Fujian, 700 m, coll. H. - w. Chen, 17 Aug.2001 (KIZ).

Paratypes - 2 males, 2 females, same data as holotype except for 15-19 Aug.2001 (SCAU).

Diagnosis. – Paramere narrowed distally, slightly hooked apically (Figs. 5, 6); aedeagus with 1 curved, lobe-shaped process basally (Fig. 5).

Description. – Thorax: Mesonotum yellow, with 3 black, longitudinal stripes per side: submedial and later stripes extend to prescutum; sublateral stripes short between scutal and scutellar sulci Pleura yellow mostly, with 1 black, longitudinal stripe medially. Scutellum medially black, laterally yellow.

Wing: Dark brown. Halter greyish black.

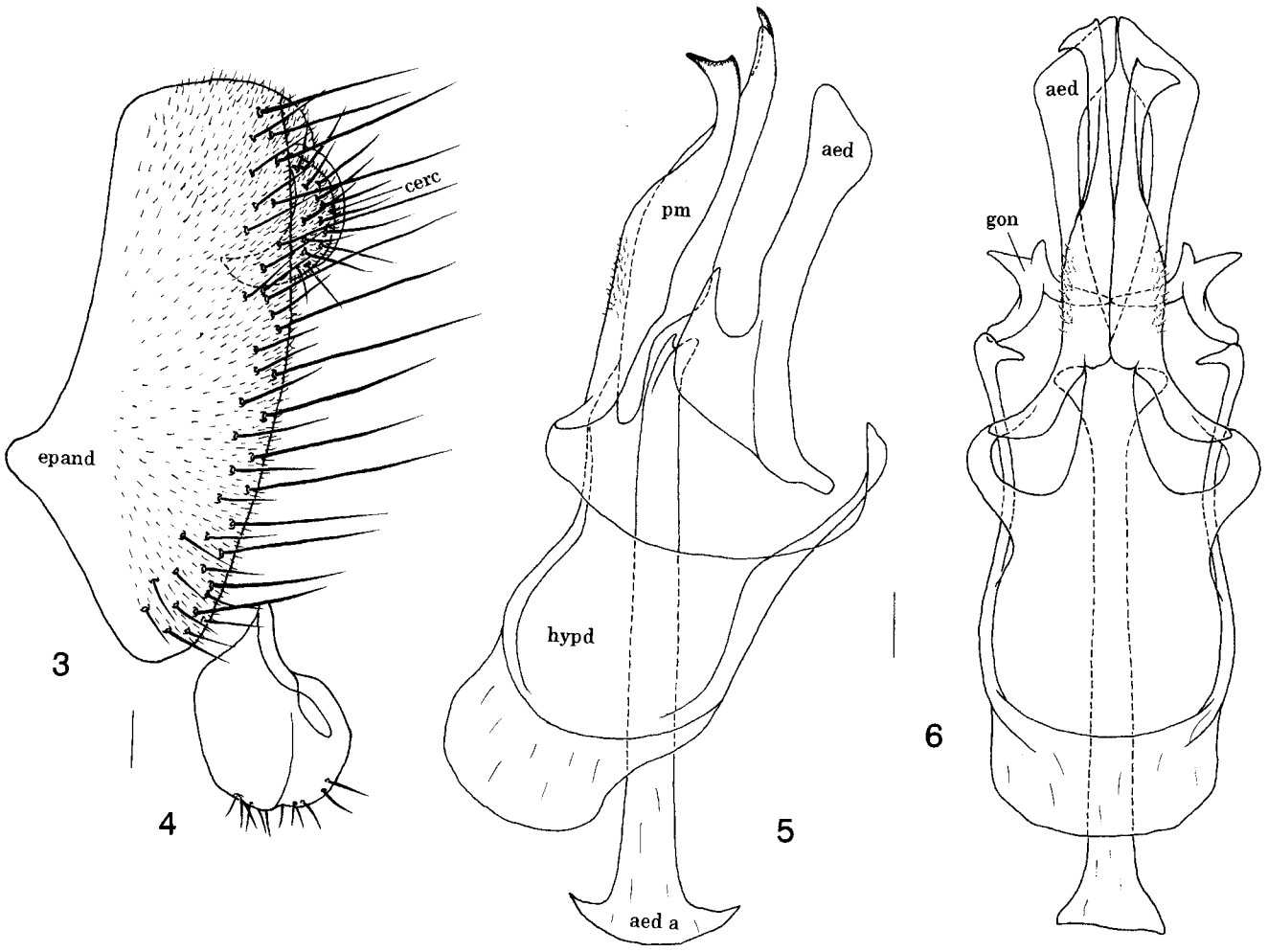
Legs: Mid tibia basally with 2 long, strong postero-dorsal setae.

Abdomen: Second to fourth tergites yellow to dark yellow on anterior margin, with laterally and medially protruded, black band on posterior margin; fifth and sixth nearly entirely black. Sternites yellow.

Male terminalia: Epandrium not constricted mid-dorsally, with 1 row of long, strong setae and 2 rows of short setae along posterior margin (Fig. 3). Surstylus with several setae on distal margin, and 1 hole near posterior margin (Fig. 4). Aedeagus apically bifurcate (Fig. 6)

For morphological terminology and index definitions, see Chen & Toda (2001) or Chen & Aotsuka (2003).
Measurements: BL = 7.10 mm (holotype), paratypes range: 6.17 (male) to and 7.23 (female); ThL = 2.84 mm (2.64 male, 2.90 female); WL = 5.40 mm (5.33 male, 5.50 female); WW = 2.10 mm (2.00 male, 2.12 female).

Indices: arb = 10/7 (10-11/6-7), avd = 0.85 (0.85), adf = 2.20 (2.30), flw = 2.60 (2.50-2.60), FW/HW = 0.40 (0.40-0.45), ch/o = 0.07 (0.07), prorb = 0.90 (0.90-0.95), rcorb = 0.55 (0.55), vb = 0.40 (0.40), dcl = 0.55 (0.55-0.60), sctl = 0.80 (0.80), sterno = 1.00 (1.00), orbito = 2.00 (1.90-2.00), dcp



Figs. 3-6. *Stegana (Oxyphortica) aotsukai*, new species, male genitalia: 3. epandrium (epand) and cercus (cerc); 4. surstylus; 5. hypandrium (hypd), paramere (pm), gonopod (gon), aedeagus (aed) and aedeagal apodeme (aed a) (ventral view); 6. ditto (lateral view) (scale-line = 0.1 mm).

= 0.20 (0.20-0.23), presctl = 0.70 (0.70-0.75), sctlp = 1.20 (1.20-1.30), C = 2.58 (2.56-2.60), 4c = 0.73 (0.70-0.75), 4v = 1.22 (1.13-1.20), 5x = 0.53 (0.50-0.54), ac = 4.71 (4.70-4.75), M = 0.18 (0.15-0.17), C3F = 1.00 (1.00).

Etymology. – The specific name is in honor of Dr. T. Aotsuka of the Department of Biology, Tokyo Metropolitan University, Japan (TMUJ).

Distribution. – China (Fujian).

Remarks. – This species resembles *S. (O.) nigripennis* in the many characters, but can be clearly distinguished from the latter by paramere distally narrowed and aedeagus basally with 1 curved process (paramere distally broad and aedeagus basally without curved process in *nigripennis*).

Stegana (Oxyphortica) prigenti, new species

(Figs. 7-10)

Material examined. – Holotype - male, CHINA: Yexianggu, Mengyang, Xishuangbanna, Yunnan, coll. H. - w. Chen, 9 Sep.2002 (KIZ).

Paratypes – CHINA: 2 males, 13 females, same data as holotype expect for 13,14 Sep.2002 (1 male, 3 females: SCAU; 7 females: KIZ; 1 male, 3 females: SEHU). THAILAND: 1 male, 1 female, Khao Yai, coll. S. Prigent, 8 Jun.1997 (NMNH).

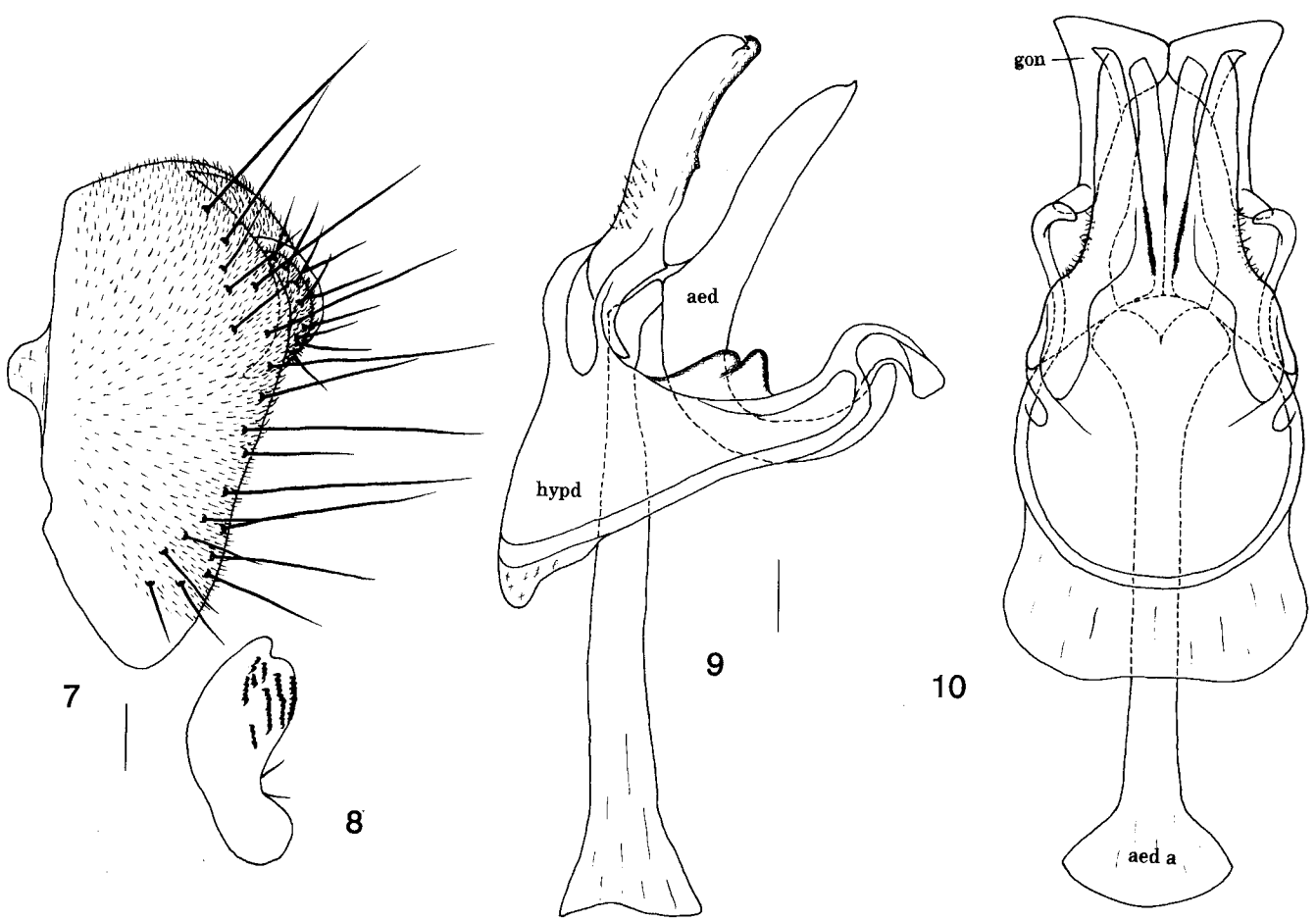
Diagnosis. – Paramere apically pointed with 1 small fissure (Fig. 9); surstylus with ca. 4 rows of scale-shaped processes basally (Fig. 8).

Description. – Thorax: Mesonotum submedially and laterally with black longitudinal stripes, 2 per side; submedial stripes converge on prescutum. Pleura with 2 longitudinal stripes: upper one long below wing, the lower short on katepisterum.

Wing: Dark brown, yellow along posterior margin. Halter: stalk grey; apical part white.

Legs: Mid tibia basally with 2 (mostly) -3 (sometimes) long, strong postero-dorsal setae.

Abdominal tergites mostly yellow, with narrow, black band on lateral and posterior margins. Sternites black, yellow on lateral margins.



Figs. 7-10. *Stegana (Oxyphortica) prigenti*, new species, male genitalia: 3. epandrium (epand) and cercus (cerc); 4. surstylus; 5. hypandrium (hypd), paramere (pm), gonopod (gon), aedeagus (aed) and aedeagal apodeme (aed a) (ventral view); 6. ditto (lateral view) (scale-line = 0.1 mm).

Male terminalia: Epandrium constricted mid-dorsally, with 1 row of long, strong setae and several short setae along posterior margin (Fig. 7). Hypandrium with 1 flap postero-laterally (Fig. 9). Paramere with serrated processes inter-subbasally (Fig. 10), medially with 1 sclerotized projection (Fig. 9). Aedeagus broadly separated apically (Fig. 10).

Measurements: BL = 6.50 mm (holotype) range in 3 males and 3 females paratypes: 5.90-6.70 (male), 5.30-7.55 (female); ThL = 2.80 mm (2.50-2.90 male, 2.40-3.10 female); WL = 5.00 mm (4.70-5.10 male, 4.50-6.00 female); WW = 1.80 mm (1.70-1.90 male, 1.60-2.00 female).
Indices: arb = 10/8 (10-11/7-8), avd = 0.95 (0.85-0.95), adf = 3.00 (3.00-3.20), flw = 2.60 (2.50-2.60), FW/HW = 0.40 (0.40-0.45), ch/o = 0.06 (0.06), prorb = 0.90 (0.85-0.90), rcorb = 0.65 (0.60-0.70), vb = 0.40 (0.50), dcl = 0.55 (0.50-0.60), presctl = 0.70 (0.70-0.75), sctl = 0.90 (0.90-1.00), sterno = 0.90 (0.90-0.95), orbito = 1.10 (1.10-1.20), dcp = 0.20 (0.20-0.23), sctlp = 1.20 (1.20-1.30), C = 2.77 (2.66-2.78), 4c = 0.73 (0.62-0.75), 4v = 1.24 (1.13-1.30), 5x = 0.50 (0.40-0.50), ac = 5.00 (4.20-5.25), M = 0.17 (0.15-0.17), C3F = 1.00 (1.00).

Etymology. – The specific name is in honor of Dr. S. Prigent of the Drosophila Genetic Resource Center, Kyoto Institute of Technology, Japan (KITJ).

Distribution. – China (Yunnan), Thailand.

Remarks. – This species resembles *S. (O.) nigripennis* in the same characters, but can be clearly distinguished from the latter by paramere inter-subbasally with serrated processes and medially with 1 sclerotized projection, and surstylus with ca. 4 rows of scale-shaped processes basally (they are absent in *nigripennis*).

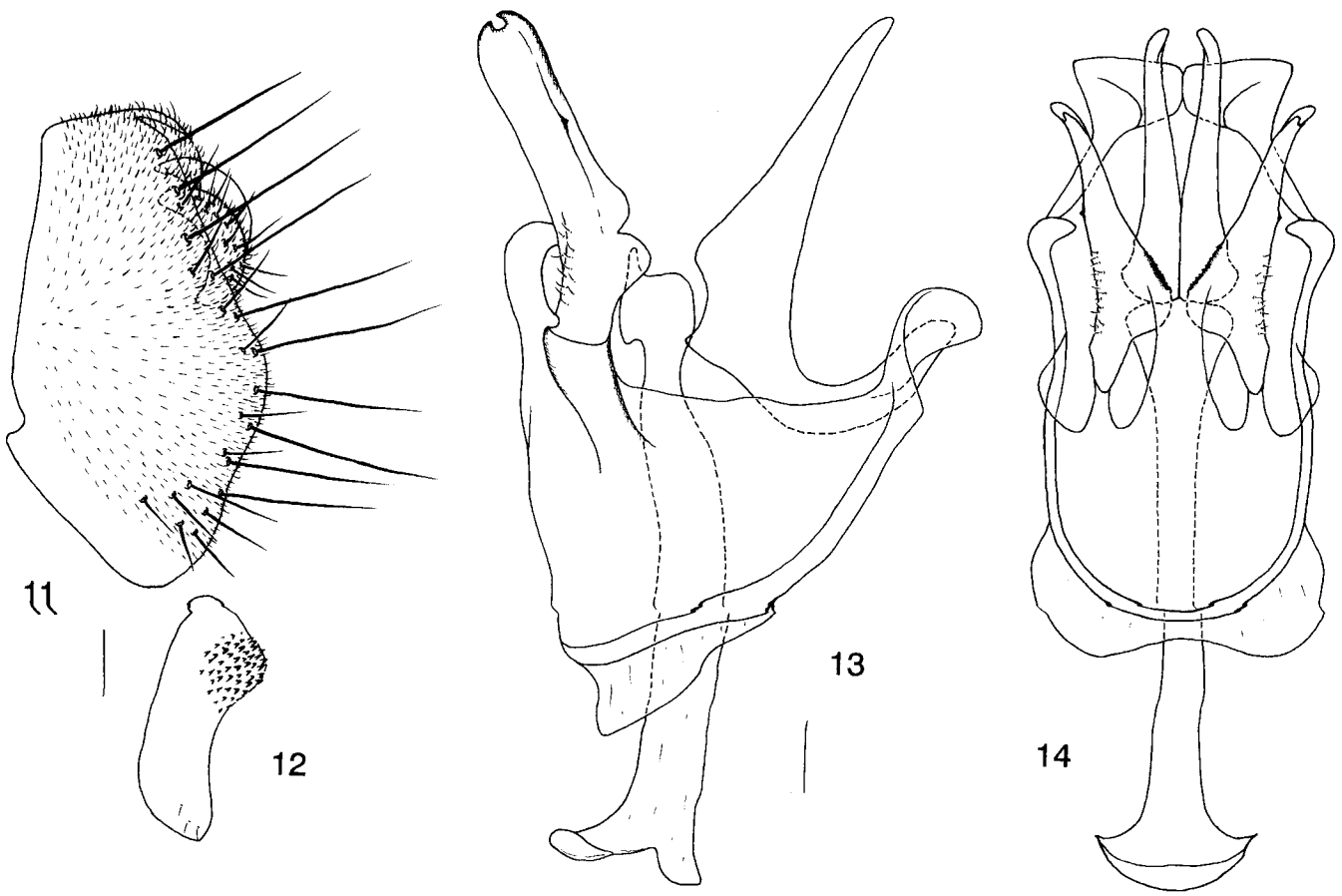
Stegana (Oxyphortica) trisetosa, new species
(Figs. 11-14)

Material examined. – Holotype - male, MALAYSIA (BORNEO): Lambir, Sarawak, coll. M. J. Toda, 8 Jan.1999 (FRC).

Paratypes - MALAYSIA (BORNEO): Sabah: 1 male, Poring, 16 Mar.1999 (KPSP); 1 male, Mahua, Crocker Range, coll. M. J. Toda, 18 Oct.1999 (ITBC).

Diagnosis. – Paramere apico-medially and subbasally each with 1 distinct incision (Fig. 13); surstylus with dense, irregular scale-shaped processes basally (Fig. 12).

Description. – Thorax: Mesonotum submedially and laterally with black longitudinal stripes, 2 per side; submedial stripes converge on prescutum. Pleura with 2 long, longitudinal



Figs. 11-14. *Stegana (Oxyphortica) trisetosa*, new species, male genitalia: 3. epandrium (epand) and cercus (cerc); 4. surstylus; 5. hypandrium (hypd), paramere (pm), gonopod (gon), aedeagus (aed) and aedeagal apodeme (aed a) (ventral view); 6. ditto (lateral view) (scale-line = 0.1 mm).

stripes: one of them below wing, the other from fore coxa to metapleura.

Wing: Dark brown, yellow along posterior margin. Halter: stalk grey; apical part white.

Legs: Mid tibia basally with 3 long, strong posterodorsal setae.

Abdominal tergites yellow, black along lateral and posterior margins. Sternites black.

Male terminalia: Epandrium constricted mid-dorsally, with 1 row of long, strong setae and several short setae along posterior margin (Fig. 11). Paramere inter-subbasally with serrated process (Fig. 14), medially with 1 sclerotized projection (Fig. 13). Aedeagus apically broadly separated (Fig. 14).

Measurements: BL = 6.80 mm in the holotype (range in 2 males paratypes: 6.20-7.00); ThL = 2.45 mm (2.00-2.20), WL = 5.70 mm (5.60-5.80); WW = 2.10 mm (2.00-2.10). Indices: arb = 14/8 (13-14/7-8), avd = 0.80 (0.75-0.80), adf = 3.50 (3.50-3.60), flw = 2.40 (2.40-2.50), FW/HW = 0.40 (0.40-0.45), ch/o = 0.06 (0.06), prorb = 0.70 (0.70-0.75), rcorb = 0.60 (0.60), vb = 0.40 (0.35-040), dcl = 0.40 (0.40-0.50), presctl = 0.70 (0.70), sctl = 0.90 (0.85-0.90), sterno = 0.85 (0.80-0.85), orbito = 1.20 (1.20), dcp = 0.15 (0.15), sctlp = 1.20 (1.20), C = 2.97 (2.86-2.96), 4c = 0.65 (0.62-0.65), 4v = 1.00 (1.00-1.10), 5x = 0.39 (0.40-0.43), ac = 5.50 (5.20-5.30), M = 0.14 (0.13-0.15), C3F = 1.00 (1.00).

Etymology. – A combination of the Latin words: "tri-" + "setosa" meaning 3 setae, a reference to the setation of the mid tibia.

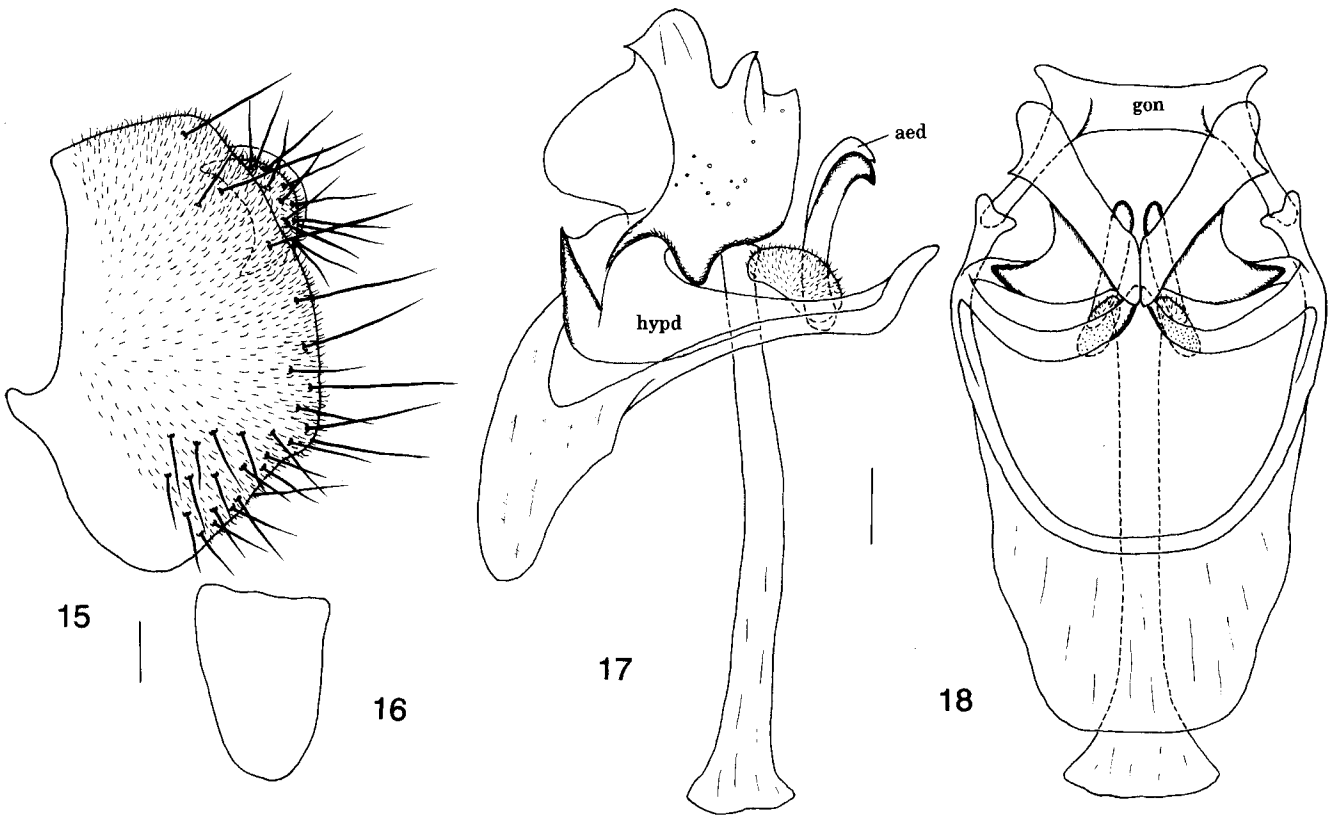
Distribution. – Malaysia (Borneo).

Remarks. – This species resembles *S.* (*O.*) *prigenti* in the many characters, but can be clearly distinguished from the latter by apico-medially and subbasally each with 1 distinct incision and surstylus with dense, irregular scale-shaped processes basally.

Stegana (*Oxyphortica*) *yapingi*, new species
(Figs. 15-18)

Material examined. – Holotype - male, MALAYSIA (BORNEO): Lambir, Sarawak, coll. M. J. Toda, 8 Jan.1999 (FRC).

Paratypes - MALAYSIA (BORNEO): 3 males, 4 females, same data as holotype (1 male, 2 females, FRC; 1 male, 1 female, SCAU; 1 male, 1 female, SEHU); Sabah, Poring: 2 females, 30 Dec.1998 (ITBC); 3 males, coll. M. J. Toda, 16 Mar.1999 (KPSP).



Figs.15-18. *Stegana* (*Oxyphortica*) *yapingi*, new species, male genitalia: 3. epandrium (epand) and cercus (cerc); 4. surstylus; 5. hypandrium (hypd), paramere (pm), gonopod (gon), aedeagus (aed) and aedeagal apodeme (aed a) (ventral view); 6. ditto (lateral view) (scale-line = 0.1 mm).

Diagnosis. – Paramere broad, triangalar, strongly sclerotized basally (Figs. 17, 18); aedeagus short rod-like, apically hooked, basally with 1 pubescent flap attached to aedeagal apodeme (Figs. 17, 18).

Description. – Thorax: Mesonotum submedially and laterally with black longitudinal stripes, 2 per side; submedial stripes not convergent on prescutum. Pleura with 2 long, black stripes: one below wing, the other from fore coxa to metapleura.

Wing: Black, yellow along posterior margin. Halter: stalk grey; apical part white.

Legs: Mid tibia basally with 2 long, strong postero-dorsal setae.

Abdominal tergites yellow, black on lateral and posterior margins. Sternites black, yellow on lateral margins.

Male terminalia: Epandrium not constricted mid-dorsally, broad laterally; with 1 row of long, strong setae along posterior margin and ca. 3 irregular rows of short setae near postero-ventral margin (Fig. 15). Surstylus lacking setae on outer surface (Fig. 16).

Measurements: BL = 6.10 mm in the holotype (range in 3 males and 3 females paratypes: 5.60-6.70 male, 5.70-7.15 female); ThL = 2.67 mm (2.50-3.00 male, 2.60-3.10 female); WL = 5.50 mm (5.00-6.00 male, 5.00-6.50 female); WW = 2.00 mm (1.80-2.20 male, 1.80-2.20 female).
Indices: arb = 12-13/7-8 (12-13/7-8); avd = 0.85 (0.80-0.90); adf = 3.50 (3.40-4.00); flw = 2.10 (1.90-2.10); FW/HW = 0.30; ch/o = 0.05 (0.06); prorb = 0.75 (0.70-0.80); rcorb = 0.55 (0.50-0.60); vb = 0.30 (0.30-0.35); dcl = 0.40 (0.45); presctl = 0.70 (0.70-0.75); sctl = 1.15 (1.00-1.15); sterno = 0.70 (0.70-0.80); orbito = 1.20 (1.20-1.40); dcp = 0.15 (0.15-0.17); sctlp = 1.20 (1.10-1.20); C = 3.00 (2.84-3.00); 4c = 0.64 (0.63-0.68); 4v = 1.18 (1.15-1.25); 5x = 0.40 (0.40-0.47); ac = 5.00 (4.70-5.20); M = 0.15 (0.13-0.17); C3F = 1.00 (1.00).

Etymology. – The specific name is in honor of Dr. Yaping Zhang of Kunming Institute of Zoology (KIZ).

Distribution. – Malaysia (Borneo).

Remarks. – This species has special type in paramere, it is easy to distinguish from the other members of the *nigripennis* species-group.

KEY TO SPECIES OF THE *NIGRIPENNIS* SPECIES-GROUP

Male

0. Interfrontal setulae dense, thick; lunule developed, black; mesonotum and pleura yellow with 3-4 black, longitudinal stripes; wing dark brown to black, pale along posterior margin, with 3-4 yellow patches (*nigripennis* species-group). 1
1. Mesonotum with 3 and pleura with 1 longitudinal stripe(s); mid tibia basally with 2 long, strong postero-dorsal setae; paramere asymmetrical. 2
– Mesonotum and pleura each with 2 longitudinal stripes; mid tibia basally mostly with 3 long, strong postero-dorsal setae; paramere symmetrical. 3
2. Paramere narrowed distally, apically slightly hooked. ..... *aotsukai*, new species
– Paramere not narrowed distally, apically round with 1 small process. ..... *nigripennis* (Hendel)
3. Paramere broad, triangular, strongly sclerotized basally; aedeagus short rod-like, apically hooked, basally with 1 pubescent flap attached to aedeagal apodeme. ..... *yapingi*, new species
– Paramere and aedeagus long lobe or rod-like; aedeagus apically straight. 4
4. Paramere apically with 1 pointed process; surstylus basally with ca. 4 row of scale-shaped processes. ..... *prigenti*, new species
– Paramere apico-medially with 1 incision; surstylus basally with dense scale-shaped processes. ..... *trisetosa*, new species

ACKNOWLEDGEMENTS

We are grateful to Prof. M. J. Toda (Hokkaido University, Japan (HUJ) and Dr. S. Prigent (KITJ), who provided us with specimens they had collected. We wish to thank Dr. T. Yoshida (HUJ) for the photographs, Dr. T. Aotsuka (TMUJ) and Dr. Y.-P. Zhang (KIZ), who helped us with our research in Mt. Wuyi, Fujian and Xishuangbanna, Yunnan. This study was supported by the Japan Society for the Promotion of Science (Nos. 12375002 and 01111) and the National Natural Science Foundation of China (Nos. 39930100 and 30024004).

LITERATURE CITED

Chen, H.-w. & T. Aotsuka, 2003. A survey of the genus *Leucophenga* (Diptera, Drosophilidae) in Iriomote-jima, Japan, with descriptions of three new species. *The Canadian Entomologist*, **135**: 1-16.

Chen, H.-w. & M. J. Toda, 2001. A revision of the Asian and European species in the subgenus *Amiota* Loew (Diptera, Drosophilidae) and establishment of species-groups based on phylogenetic analysis. *Journal of Natural History*, **35**: 1517-1563.

Chen, H.-z. & M. J. Toda, 1994. Six new species of the Drosophilidae (Diptera) from eastern China. *Japanese Journal of Entomology*, **62**: 537-554.

Duda, O., 1923. Die orientalischen und australischen Drosophiliden-Arten (Dipteren) des Ungarischen National-Museums zu Budapest. *Annales Historico-Naturales Musei Nationalis Hungarici*, **20**: 24-59.

Duda, O., 1926. Die orientalischen und australischen Drosophiliden-Arten (Dipteren) des Ungarischen National-Museums zu Budapest. *Annales Historico-Naturales Musei Nationalis Hungarici*, **23**: 241-250.

Hendel, F., 1913. Neue amerikanische Dipteren. *Deutsche entomologische Zeitschrift*, **1913**: 617-636.

Hendel, F., 1914. Acalyptrate musciden (Diptera). *Supplementa Entomologica*, **3**: 90-117.

Meijere, J. C. H. de., 1914. Studien uber sudostasiatische Dipteren. *Tijdschrift voor entomologie.* **54**: 258–432.

Okada T., 1956. *Systematic Study of Drosophilidae and allied families of Japan.* Gihodo Co. Ltd., Tokyo. Pp. 1-183.

Okada, T., 1968. Addition to the fauna of the family Drosophilidae of Japan and adjacent countries (Diptera, Drosophilidae). *Kontyû, Tokyo*, **36**: 303-323.

Okada, T., 1971. A revision and taxometric analysis of the genus *Stegana* Meigen of Japan and adjacent countries (Diptera, Drosophilidae). *Mushi*, **45**: 81-99.

Okada, T., 1978. *Pseudostegana*, a new subgenus of the genus *Stegana* Meigen (Diptera, Drosophilidae). *Kontyu, Tokyo*, **46**: 392-399.

Okada, T., 1988. Taxonomic outline of the family Drosophilidae of Japan. In: Suzuki, K. (ed), *Selected Papers by Dr. Toyohi Okada.* The Association of the Memorial Issue of Dr. Toyohi Okada, Toyama, Japan. Pp. 1-87.

Schiner, I. R., 1862. Vorläufiger Commentar zum dipterologischen Theile der "Fauna Austriaca". *Wiener Entomologische Monatschrift,* **6**: 428-436.

Sidorenko, V. S., 1997. New Asian species and new records of the genus *Stegana* Meigen (Diptera, Drosophilidae). I. Subgenus *Oxyphortica* Duda and *Stegana* s. str. *Annales de la Societe Entomologique de France (N. S.)*, **33**: 65-79.

Sidorenko, V. S., 1998. New Asian species and new records of the genus *Stegana* Meigen (Diptera, Drosophilidae). III. Descriptions, Taxonomic Remarks and Key to the Asian species. *Annales de la Societe Entomologique de France (N. S.)*, **34**: 285-300.

Toda, M. J. & T. X. Peng, 1992. Some species of the subfamily Oxyphorticae (Diptera, Drosophilidae) from Guangdong Province, southern China. *Annales de la Societe Entomologique de France (N. S.)*, **28**: 201-213.

Wheeler, M. R., 1981. The Drosophilidae: A taxonomic overview. In: Ashburner, M., H. L. Carson & J. N. Thompson, Jr. (eds.), *The Genetics and Biology of Drosophila*, Academic Press, New York and London, **3a**: 1-97.