

THREE NEW SPECIES OF *STEGANA* (*OXYPHORTICA*) FROM YUNNAN PROVINCE, SOUTHWESTERN CHINA (INSECTA: DIPTERA: DROSOPHILIDAE)

Miao-Feng Xu

Department of Entomology, South China Agricultural University, Tianhe,
Guangzhou 510642, P. R. China

Jian-Jun Gao

Laboratory for Conservation and Utilization of Bio-resource, Yunnan University, Cuihubei-lu 2,
Kunming 650091, P. R. China

Hong-Wei Chen

Department of Entomology, South China Agricultural University, Tianhe,
Guangzhou 510642, P. R. China

Email: hongweic@scau.edu.cn (Corresponding author)

ABSTRACT. – Three new species from Yunnan Province, southwestern China are described: *Stegana* (*Oxyphortica*) *latipennis*, new species, *S. (O.) acutipennis*, new species and *S. (O.) hirtipennis*, new species. All are morphologically similar to *S. (O.) adentata* Toda & Peng, 1992.

KEY WORDS. – Drosophilidae, *Stegana*, new species, Yunnan, China.

INTRODUCTION

The small subgenus *Oxyphortica* Duda, 1923, in the genus *Stegana* Meigen, 1830, comprises 16 species from the Oriental Region. Only one species-group with five species, the *nigripennis* species-group, has been established in this subgenus by Chen & Wang (2004). Chen & Aotsuka (2004) described a species, *Stegana (O.) dendrobium* from Kyushu, Japan, that they thought similar to *S. (O.) nigripennis* (Hendel, 1914) and should thus also belong to the *nigripennis* group according to the diagnosis of this group given by Chen & Wang (2004). But the species-group classification for the other species remains unsettled. Three new species collected from Yunnan Province, southwestern China, are here described. These new species are morphologically similar to *S. (O.) adentata* Toda & Peng, 1992, in having the cercus lacking pubescence (ch. 1), the surstylus without prensisetae (ch. 2), and the aedeagus densely haired (ch. 3). However, these characters are not all simultaneously present in the following species: *S. (O.) burmensis* Sidorenko, 1997, from Myanmar (sharing ch.1 and ch.2), *S. (O.) watabei* Sidorenko, 1998, from Indonesia (ch.2 and ch.3, not mentioned in the original description), *S. (O.) maichouensis* Sidorenko, 1998, from Vietnam (ch.1 and ch.3), *S. (O.) convergens* (de Meijere, 1911); widely distributed from Taiwan to Java and New Guinea (ch.3), *S. (O.) setifrons* Sidorenko, 1997, from central

China (ch.3), and *S. (O.) enigma* Sidorenko, 1998, from Vietnam (ch.2).

All specimen examined were collected from tree trunks along streams in forests. The type specimens are deposited in the following institutions: Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming, China (KIZ); Department of Entomology, South China Agricultural University, Guangzhou, China (SCAU). For morphological terminology and index definitions, see Chen & Toda (2001) or Chen & Aotsuka (2003).

TAXONOMY

Subgenus *Oxyphortica* Duda

Oxyphortica Duda, 1923: 34 (as subgenus of *Phortica*); Okada, 1971: 90 (transferred this subgenus to *Stegana*). Type species: *Drosophila convergens* de Meijere, 1911.

Diagnosis. – (Modified from Okada, 1971, 1978; Sidorenko, 1998). M_1 distally and weakly curved forward; midleg tibia basally with two (usually) to three long, strong setae on posterodorsal surface; mesopleuron with two dark longitudinal stripes.

***Stegana (Oxyphortica) adentata* Toda & Peng, 1992**

Stegana (Oxyphortica) adentata Toda, 1992: 210; Sidorenko, 1998: 296.

Material examined. – China: 5 males, 11 females, Mt. Nanling (25°00'N 113°24'E), Ruyuan, Guangdong, alt. 700 m, coll. Miao-feng Xu & Hui-luo Cao, 5–6 Oct.2004; 2 males, Mt. Maoer (25°51'N 110°27'E), Guilin, Guangxi, alt. 500 m, coll. Miao-feng Xu, 19 Oct.2004; 1 male, Yixiang (22°47'N 101°02'E), Simao, Yunnan, alt. 1,200 m, coll. Jian-jun Gao, 6 Dec.2002; 3 males 1 female, Xishuangbanna Tropical Botanical Garden (21°41'N 101°25'E), Menglun, Yunnan, alt. 600 m, coll. Masanori J. Toda, 12 Aug.2002.

Distribution. – China: Guangdong (Nanling, Conghua, Fengkai), Guangxi (Guilin), Yunnan (Simao, Xishuangbanna); Vietnam.

***Stegana (Oxyphortica) latipenis*, new species**

(Figs. 1–4)

Material examined. – Holotype: male, CHINA, Bubang (21°28'N 101°38'E), Mengla, Xishuangbanna, Yunnan, alt. 700 m, coll. Hong-wei Chen, 11 Sep.2002 (KIZ).

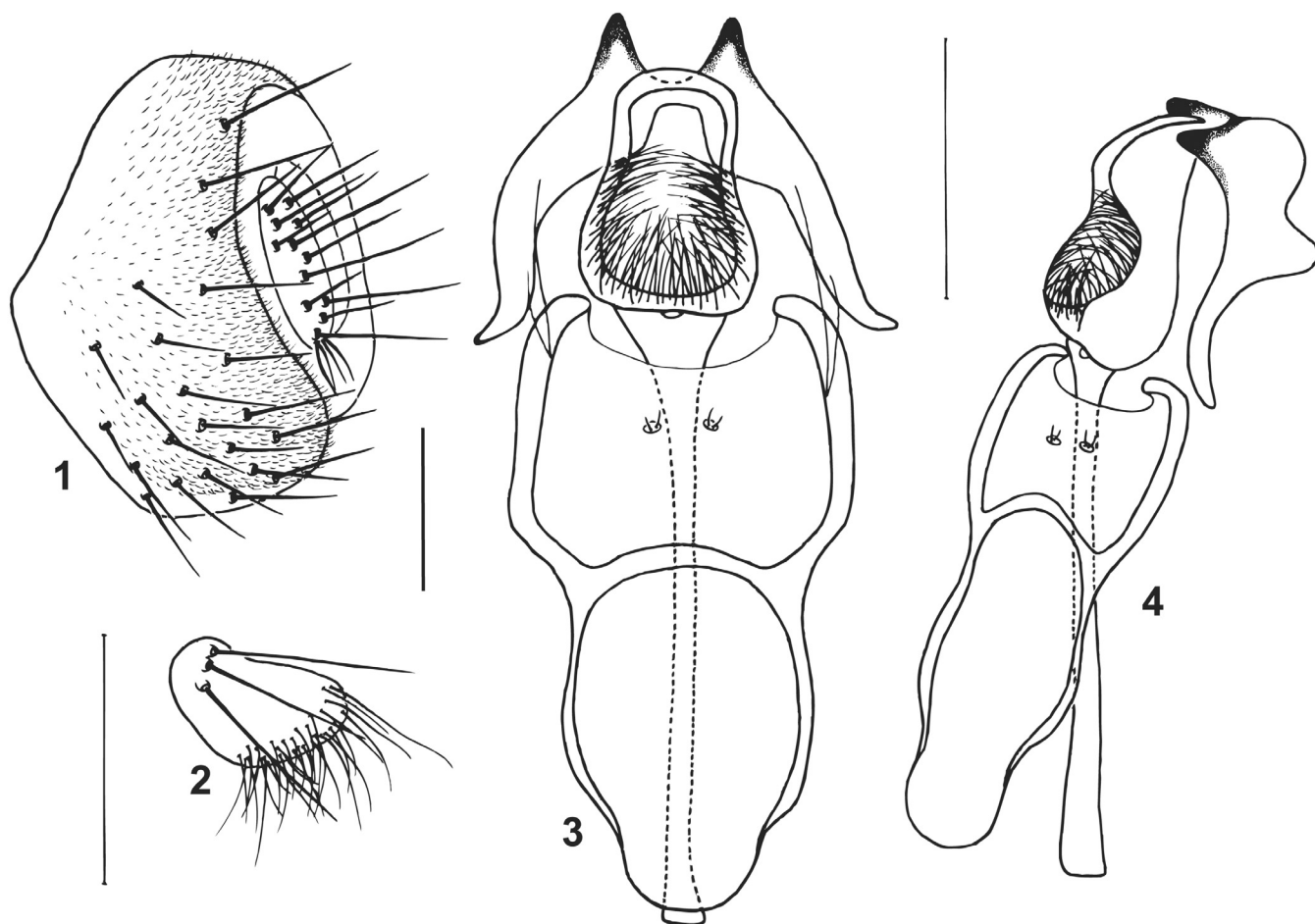
Paratypes: 2 males, same data as holotype (SCAU).

Diagnosis. – Surstylus somewhat oblong, basally with *ca.* 3 long bristles, distally densely setigerous (Fig. 2); paramere very small, with 2 small sensilla; aedeagus basally expanded, apically round (Fig. 3); gonopod large, submedially with 2 processes (Figs. 3, 4).

Description. – Male. Head: Eyes brownish red. Ocellar triangle dark brown. Postocellar seta small. Frons and fronto-orbital plate brown, with several minute interfrontal setulae. Pedicel yellowish brown, with 2 long setae and several minute setulae; first flagellomere grayish yellow, apically narrowing. Face yellow; facial carina slightly prominent. Clypeus grayish brown. Gena yellowish brown, anteriorly darker. Postgena narrow, linear. Palpus yellow, with 4 long setae and several minute setulae.

Thorax: Mesoscutum yellowish brown; acrostichal setulae in *ca.* 10 irregular rows. Scutellum yellowish brown, marginally slightly dark. Basal scutellar setae divergent; apical scutellar setae crossed. Postpronotal lobe grayish yellow, with 1 long seta. Thoracic pleura grayish brown, with broad, brown, longitudinal stripe above. Katepisternum with 3 setae, of which the medial one is the shortest.

Wing: Yellowish brown, paler basally and posteriorly. Veins dark brown. Costal vein between R_{2+3} and R_{4+5} with *ca.* 6



Figs. 1–4. *Stegana (Oxyphortica) latipenis*, new species, male genitalia: 1, epandrium and cercus (lateral view); 2, surstylus (frontal view); 3, hypandrium, gonopod, paramere, aedeagus and aedeagal apodeme (ventral view); 4, ditto (lateral view). Scale bar = 0.1 mm.

peg-like spinules on ventral surface. R_{2+3} and R_{4+5} nearly straight. M_1 distally weakly convergent to R_{4+5} . Basal medial-cubital crossvein present. Halter grayish yellow, basally slightly brownish.

Legs: Yellow, slightly darker at knee joints. Midleg tibiae proximally with 2 stout, long posterior setae. Preapical dorsal setae on all legs; apical setae only on midlegs. Midleg tarsi ventrally with 2 rows and hindleg tarsi ventrally with 1 row of minute cuneiform bristles. Fore- and midleg metatarsi as long as the three succeeding tarsal segments together; hindleg metatarsus slightly shorter than the three succeeding together.

Abdomen: All tergites mostly grayish brown; second to sixth tergites yellow along anterior margin. Sternites yellow.

Male terminalia: Epandrium broad below, pubescent except for anterior and ventral margins, lacking apodeme on anterior margin (Fig. 1). Cercus separate from epandrium, narrow, setigerous but lacking pubescence (Fig. 1). Surstylus small, without prenisetae (Fig. 2). Hypandrium broad, medially slightly constricted. Gonopods partially covering aedeagus, basolaterally contiguous to hypandrium. Aedeagus basally with short, thick, densely distributed, hair.

Measurements: BL = 3.35 mm in holotype, range in 2 male paratypes: (2.55-2.75); ThL = 1.58 mm (1.16-1.34), WL = 2.65 mm (2.15-2.20); WW = 1.16 mm (0.98-1.02).

Indices: arb = 8/5 (6-7/3-5), avd = 1.00 (1.00), adf = 2.78 (2.22-2.60), flw = 2.22 (1.89-2.10), FW/HW = 0.35 (0.37), ch/o = 0.09 (0.06-0.07), prorb = 1.21 (0.83-0.94), rcorb = 0.66 (0.59-0.61), vb = 0.62 (0.45-0.50), dcl = 0.47 (0.41-0.45), presctl = 0.51 (0.50-0.51), sctl = 1.17 (1.25), sterno = 0.72 (0.89-0.90), orbito = 1.22 (1.38-1.78), dcp = 0.24 (0.23-0.24), sctlp = 1.00 (1.00), C = 2.76 (2.56-2.70), 4c = 0.83 (0.82-0.86), 4v = 1.83 (1.67-1.86), 5x = 1.73 (1.55-1.60), ac = 6.44 (6.00), M = 0.54 (0.52-0.57), C3F = 1.00 (1.00).

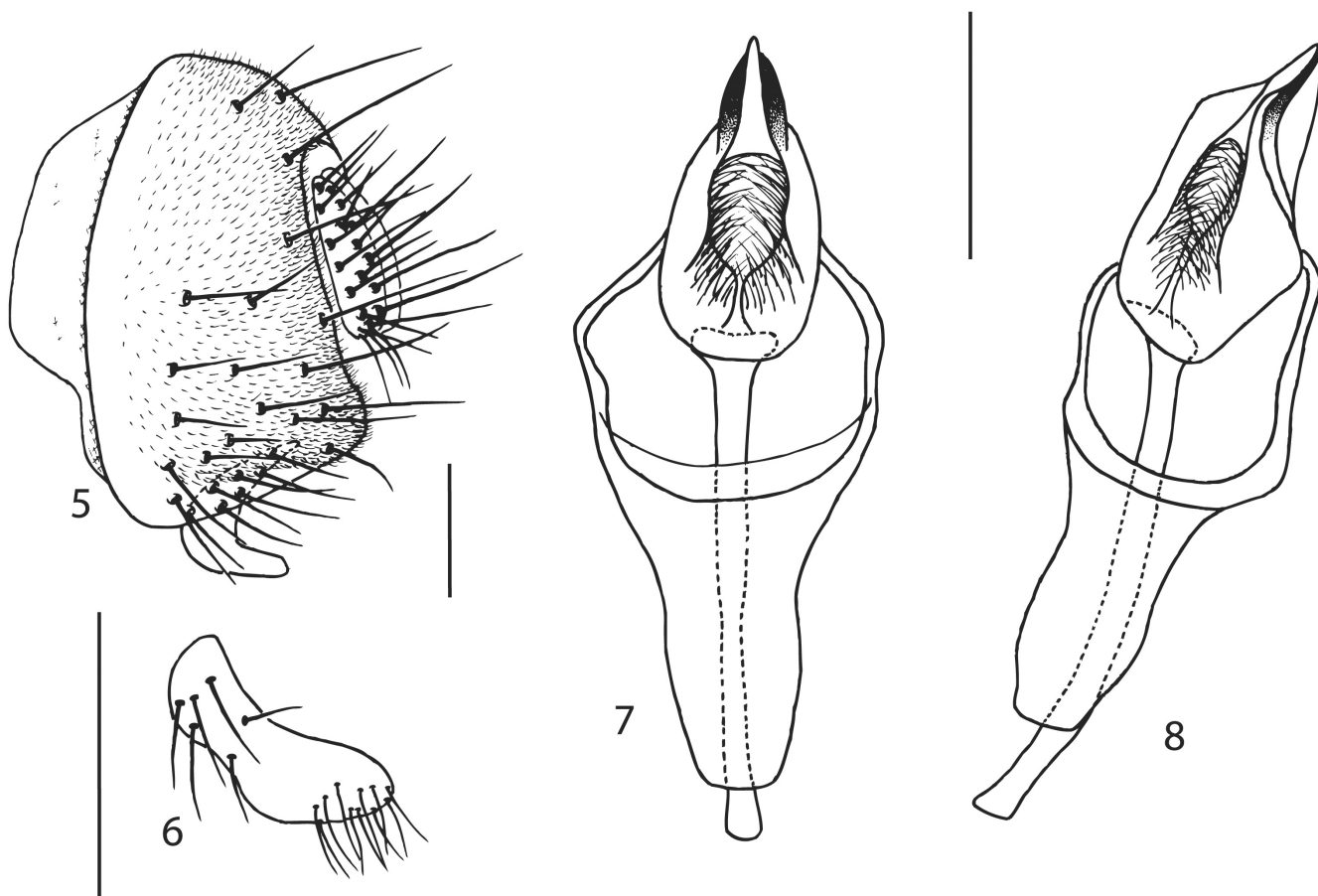
Etymology. – A combination of the Latin words: “latus” and “penis”, referring to the apically broadened aedeagus.

Distribution. – China (Yunnan).

Remarks. – This species is very similar to *S. (O.) adentata* with regard to the bilobed gonopod and broad hypandrium, but can be distinguished from it by the paramere and the aedeagus (in *adentata* the paramere is absent and the aedeagus is basally rounded).

***Stegana (Oxyphortica) acutipenis*, new species**
(Figs. 5–8)

Material examined. – Holotype: male, CHINA, Xishuangbanna Tropical Botanical Garden, Menglun, Yunnan, alt. 700 m, coll. Hong-wei Chen, 13 Sep. 2002 (SCAU). Paratype 1 female, same data as holotype (KIZ).



Figs. 5–8. *Stegana (Oxyphortica) acutipenis*, new species, male genitalia: 5, epandrium and cercus (lateral view); 6, surstylus (frontal view); 7, hypandrium, gonopod, paramere, aedeagus and aedeagal apodeme (ventral view); 8, ditto (lateral view). Scale bar = 0.1 mm.

Diagnosis. – Surstylus elongate, basally with *ca.* 6 long bristles, submedially slightly curved, distally setigerous (Fig. 6); aedeagus basally round, medially broadened, apically narrowed, slightly sclerotized (Figs. 7, 8).

Description. – Only those characters that differ from the species above are given in this description.

Male. Head: Pedical yellow, with 1 long seta and several minute setulae.

Wing: Costal vein between R_{2+3} and R_{4+5} with *ca.* 8 peg-like spinules on ventral surface.

Abdomen: All tergites mostly dark brown to black except for second to third tergites yellow along anterior margins.

Male terminalia: Epandrium with developed apodeme on anterior margin (Fig. 5). Gonopod small lobe. Paramere absent.

Measurements: BL = 3.40 mm in holotype (4.05 mm in paratype); ThL = 1.56 mm (1.74); WL = 2.55 mm (2.95); WW = 1.18 mm (1.42).

Indices: arb = 8/6 (8/6), avd = 1.00 (1.00), adf = 2.27 (3.00), flw = 2.00 (2.40), FW/HW = 0.37 (0.36), ch/o = 0.07 (0.06), prorb = 1.17 (0.89), rcorb = 0.60 (0.66), vb = 0.45 (0.48), dcl

= 0.46 (0.46), sctl = 1.05 (1.15), sterno = 0.73 (0.60), orbito = 2.00 (1.60), dcp = 0.27 (0.28), presctl = 0.55 (0.55), sctlp = 0.84 (0.93), C = 2.60 (3.12), 4c = 0.79 (0.77), 4v = 1.55 (1.84), 5x = 1.42 (1.46), ac = 6.00 (4.92), M = 0.45 (0.49), C3F = 1.00 (1.00).

Etymology. – A combination of the Latin words: “acutus” and “penis”, referring to the apically acute aedeagus.

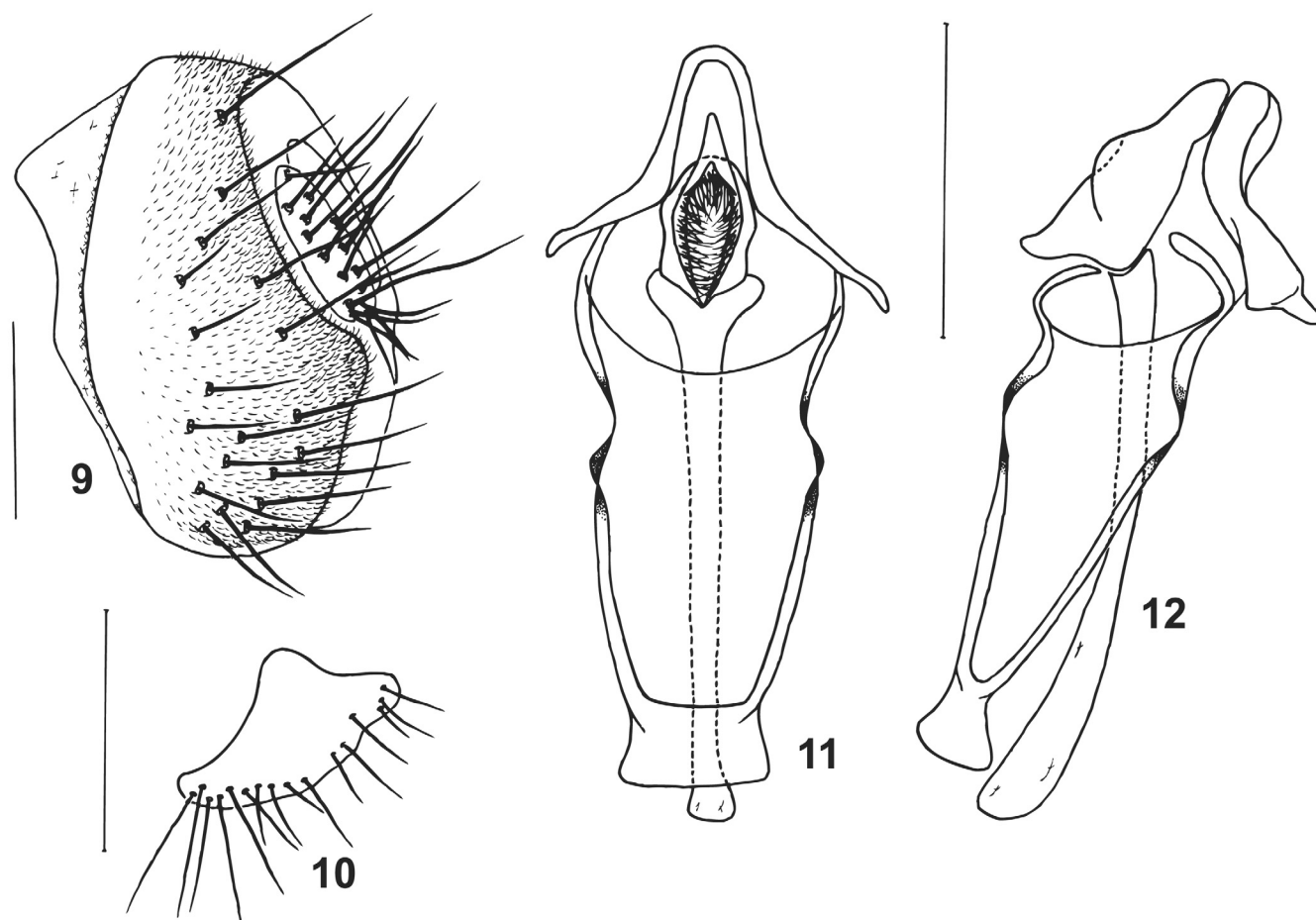
Distribution. – China (Yunnan).

Remarks. – This species resembles *S. (O.) latipenis* and *S. (O.) adentata* in that the surstylus has basally a few long bristles. But it can be clearly distinguished from *latipenis* by referring to the diagnostic characters, and from *adentata* by the aedeagus (in *adentata* the aedeagus has subapically one pair of lobe-like processes).

Stegana (Oxyphortica) hirtipenis, new species
(Figs. 9–12)

Material examined. – Holotype: male, CHINA, Yexianggu (22°20'N 100°51'E), Mengyang, Xishuangbanna, Yunnan, alt. 700 m, coll. Hong-wei Chen, 14 Sep.2002 (KIZ).

Paratype 1 male, same data as holotype (SCAU).



Figs. 9–12. *Stegana (Oxyphortica) hirtipenis*, new species, male genitalia: 9, epandrium and cercus (lateral view); 10, surstylus (frontal view); 11, hypandrium, gonopod, paramere, aedeagus and aedeagal apodeme (ventral view); 12, ditto (lateral view). Scale bar = 0.1 mm.

Diagnosis. – Surstylus nearly triangular, setigerous along inner margin (Fig. 10); aedeagus smaller, basally and apically narrowed, rounded (Figs. 11, 12); gonopod broad, not bilobed (Fig. 11).

Description. – Only those characters that differ from the species above are given in this description..

Male. Head: Pedicel yellowish brown, with 1 long seta and several minute setulae.

Wing: Costal vein between R_{2+3} and R_{4+5} with *ca.* 5 peg-like spinules on ventral surface.

Abdomen: All tergites mostly brown; second to sixth yellow on anterior margin.

Male terminalia: Epandrium with anterior margin of apodeme developed, slightly protruded on posteromedial margin (Fig. 9). Paramere absent.

Measurements: BL = 2.65 mm in holotype (2.85 mm in paratype); ThL = 1.28 mm (1.30); WL = 2.10 mm (2.10); WW = 1.00 mm (0.98).

Indices: arb = 7/4 (7/5); avd = 1.00 (1.00); adf = 2.62 (2.88); flw = 2.00 (2.13); FW/HW = 0.37(0.38); ch/o = 0.09 (0.11); prorb = 1.68 (1.04); rcorb = 0.73 (0.69); vb = 0.50 (0.59); dcl = 0.39 (0.42); presctl = 0.52 (0.44); sctl = 1.17 (1.16); sterno = 0.78 (0.70); orbito = 1.63 (1.63); dcp = 0.24 (0.24); scrlp = 1.00 (0.83); C = 2.58 (2.58); 4c = 0.96 (0.92); 4v = 2.08 (2.00); 5x = 2.00 (2.11); ac = 5.33 (5.33); M = 0.72 (0.73); C3F = 1.00 (1.00).

Etymology. – A combination of the Latin words: “hirtus” and “penis”, referring to the pubescent aedeagus.

Distribution. – China (Yunnan).

Remarks. – This species is very similar to *S. (O.) acutipennis*, in that it has the apically narrowed aedeagus, but it can be distinguished based on the surstylus and aedeagus. In *acutipennis* the surstylus is elongate, basally with *ca.* 6 long bristles, submedially slightly curved, and distally setigerous; the aedeagus is basally rounded, and medially broadened.

ACKNOWLEDGEMENTS

We wish to thank Drs. T. Aotsuka (Tokyo Metropolitan University, Japan), B.-C. Wang and Y.-P. Zhang (Kunming Institute of Zoology, Chinese Academy of Sciences, China) for supporting fieldwork, and Prof. M. J. Toda (Institute of Low Temperature Science, Hokkaido University, Japan) for his help in checking some specimens at the University Museum. This work was supported by the Japan Society for the Promotion of Science (No. 12375002), National Natural Science Foundation of China (No. 30470212) and Natural Science Foundation of SCAU (No. 4200-K03209).

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**: 143-158.
- Chen, H. W. & T. Aotsuka, 2004. A survey of the genus *Stegana* Meigen from southern Japan (Diptera, Drosophilidae), with descriptions of three new species. *Journal of Natural History*, **38**: 2779-2788.
- 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. W. & B. C. Wang, 2004. *Stegana (Oxyphortica) nigripennis* species-group, with descriptions of four new species from Southeast Asia (Insecta: Diptera: Drosophilidae). *Raffles Bulletin of Zoology*, **52**: 29-36.
- 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.
- Meigen, J. W., 1830. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten*. (Hamm Press), vol. 6, 404 pp.
- Meijere, J. C. H. de, 1911. Studien über südostasiatische Dipteren. *Tijdschrift voor Entomologie*, **54**: 258-432.
- 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). *Kontyû*, **46**: 392-399.
- 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 Steganinae (Diptera, Drosophilidae) from Guangdong Province, southern China. *Annales de la Societe Entomologique de France (N. S.)*, **28**: 201-213.