



## Four new species of *Saigusaia* Vockeroth, 1980 (Diptera: Mycetophilidae) from China

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### Abstract

Four new species of *Saigusaia* Vockeroth 1980 — *S. spinibarbis* sp. nov., *S. praegnans* sp. nov., *S. monacanthus* sp. nov., *S. aberrans* sp. nov. — are described from southeast China's of Zhejiang Province. Another species, *S. taiwan* is newly recorded from southwest China's Sichuan Province. A key to Chinese species of *Saigusaia* is provided.

**Key words:** Gnoristinae, *Saigusaia*, taxonomy, China, keys

### Introduction

*Saigusaia* was established by Vockeroth (1980) from *Boleina* of Gnoristinae, based on two species, *Saigusaia cincta* Johannsen 1912 (type-species) from North America and *Saigusaia taiwan* Saigusa 1968 from Taiwan. Maitle (1983) transferred *flaviventris* Strobl, a widespread species in Europe, from *Boletina* to *Saigusaia*. According to Vockeroth (1980), *S. taiwan* occurs in Nepal. The genus is characterized by differences in genital structure and in some external characters, e.g. Sc<sub>2</sub> present, bare, and ending well before the base of Rs; three ocelli arranged horizontally, median ocellus smaller than laterals; metepisternum with numerous short hairs; and gonostylus simple.

Thanks to Dr Wu Hong from the Institute of Forest Protection (Zhejiang Forestry College, China). He collected rich material of Mycetophilidae from different localities in Zhejiang Province. Among this material were numerous specimens of Gnoristinae, including these new species of *Saigusaia*.

### Material and methods

Specimens were collected by sweeping and Malaise traps and were preserved in 75% alcohol. Holotypes and paratypes of new species described herein are deposited in the entomological collection of Zhejiang Forestry College, Lin'an, Zhejiang Province, China. Terminology follows that McAlpine (1981) and Sli *et al.* (2000).

### Key to the species of *Saigusaia* Vockeroth 1980 known from China

1. Tergite IX broadened apically (Figs. 3, 5, 7,9); hypopygium not elongate, gonostylus simple (Figs. 7–8) or with posterior protuberance bearing at most 1 black spine .....2

- Tergite IX weakly tapered apically (Fig. 1); hypopygium elongate (Fig. 2); gonostylus with strong thumb-like lateral protuberance bearing two long black spines ..... *Saigusaia aberrans* Wu et Niu, **sp. nov.**
- 2. Shoulders, proepisternum, meskatepisternum yellow .....3
- Shoulders, proepisternum, meskatepisternum blackish brown.....4
- 3. Gonostylus strongly swollen distally, lacking strong thumb-like lateral spine-bearing protuberance (Figs. 3-4); ventral portion of tergite IX broadly emarginate (Fig. 12) .*Saigusaia praegnans* Wu et Niu, **sp. nov.**
- Gonostylus slightly swollen apically, with strong thumb-like lateral protuberance bearing one long black spine (Figs. 5-6); ventral portion of tergite IX narrowly emarginate (Fig. 13) .....  
.....*Saigusais monacanthus* Wu et Niu, **sp. nov.**
- 4. Gonostylus with small indentation on posterolateral margin at its mid-length and two rows of short spine-like setae apicomediaally (Fig. 7)..... *Saigusais spinibarbis* Wu, Yu et Niu, **sp. nov.**
- Gonostylus simple, normal (Fig. 9)..... *Saigusaia taiwan* Saigusa, 1968

### Descriptions of new species

#### *Saigusaia aberrans* Wu et Niu, **sp. nov.**

(Figs. 1, 2, 11)

**Description.** MALE. Length: Body 4.21 mm; wing: 3.37 mm.

**Head.** Vertex and occiput blackish brown, with short and strong black setae. Eye: oval, with strong postocular bristles. Ocelli three, lateral ocellus separated from median ocellus by about 1 times its own diameter and from eye margin by about 1/2 time its own diameter diameter. Frons blackish brown, bare. Antenna: Scape, pedicel, flagellomeres 1 and 2 yellow, remainder of the flagellomeres brown; first flagellomere longer than others, about 2 times as long as wide; sixth flagellomere about 1.14 times as long as wide. Face: yellow, with scattered long setae; clypeus yellow, longer than head, with scattered short hairs; palpus yellowish, 5 segmented.

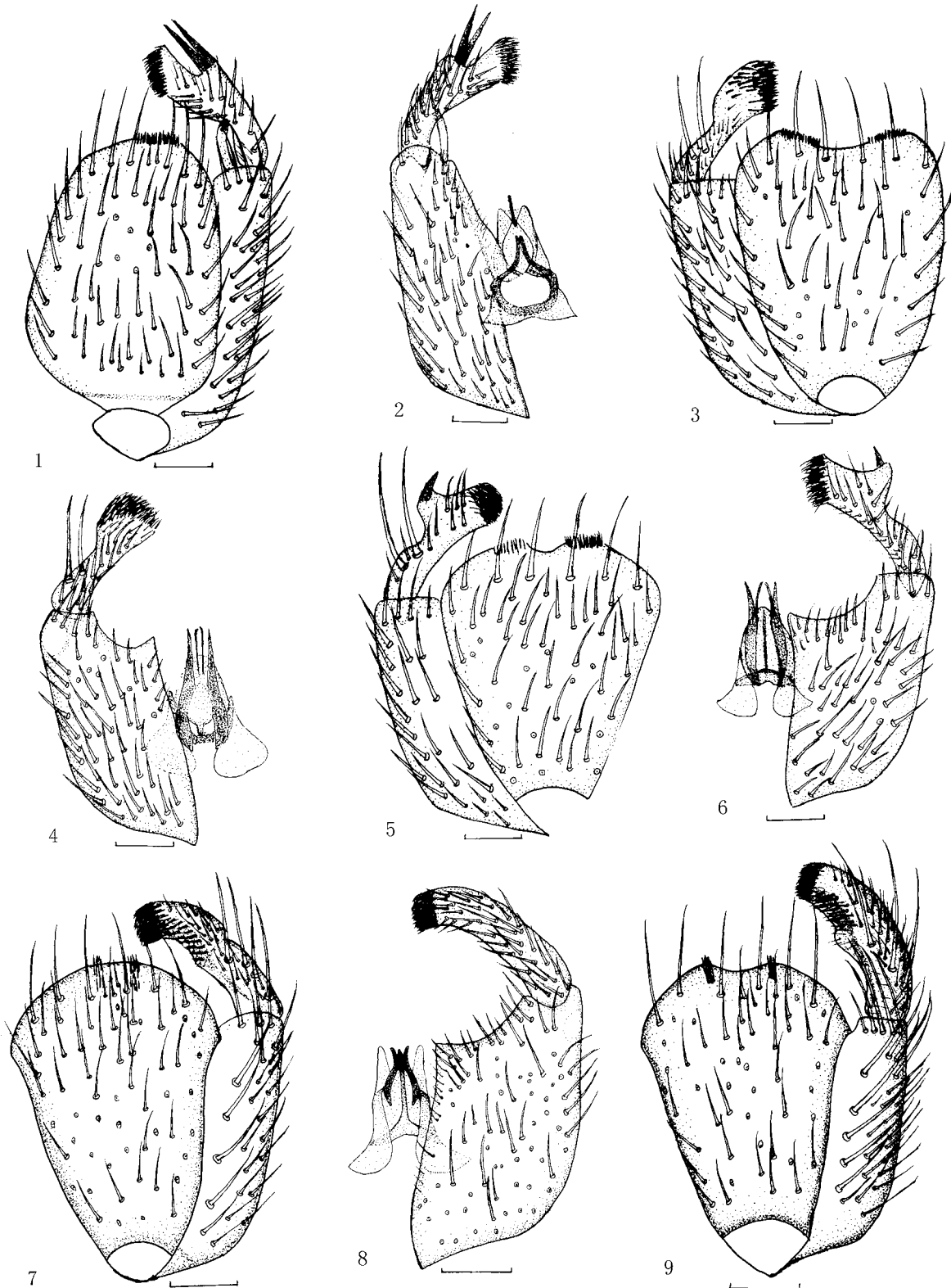
**Thorax.** Mesonotum blackish brown. Arostichals ending before 1/2 of mesonotum, a pair of pronotal bristles strong. Scutellum blackish brown, with 2 strong bristles. Mediotergite blackish brown, bare. Proepisternum, meskatepisternum, mesanepisternum brown, laterotergite blackish brown. Metepisternum brown.

**Legs.** Slender, predominantly yellow, ventral 1/4 of fore and mid trochanters, almost entire hind trochanters, basal 1/8 of hind femur brown. Leg ratios: t1: bt1= 1.56, t2: bt2=1.26, t3: bt3=1.85. Fore tibia with comb. Fore tibia with short bristles, mid tibia with four rows of long bristles and hind tibia with three rows of long bristles. The longest bristles about three times as long as tibial diameter. Tibial spurs yellow. Tarsal claws small. Empodia very small.

**Wing.** Slender, slight tapered apically, about 2.8 times as long as wide; deepened from 1/3 apical wing, Rs, R-stem, R<sub>1</sub>, R<sub>5</sub>, with dorsal setae. C slightly exceeding tip of R<sub>5</sub>, reaching to basal 1/4 point of wing margin between tips of R<sub>5</sub> and M<sub>1</sub>. Point of furcation of CuA slight before base of r-m, Lengths of r-m 2.6 times as long as Rs, stem of Median fork 2.0 times s long as r-m. Halter yellowish, with scattered long hairs at base.

**Abdomen.** Densely clothed with long setae. Sternite brown, bare. Tergites II–IV with broad yellow posteromarginal band, remainder of tergites darkish brown. Tergite VII about 1/2 as long as tergite VI, sternite VII about 2/3 as wide as tergite VII and slightly longer than tergite VII. Tergite VIII about 1/2 as long as tergite VII. Sternites II–VII with a pair of submedian fold lines and two pairs of sublateral fold lines. Tergite VIII only with submedian fold line.

**Hypopygium.** Blackish brown. Tergite IX tapered apically, with more moderate setae and some strong long bristles apically; sharply deflexed, with broad rows and bearing more short spinose setae; ventral parts of tergite IX long and broad. Gonostylus produced into two lobes, lobes very thin and short, bare, slightly incurved, with more flattened and spine-like setae at apex; two strong and long black spines on dorsal surface beyond 1/2 of gonostylus.



**FIGURES 1–9**, Male genitalia. **1**, *S. aberrans*, sp.n., dorsal view. **2**, *S. aberrans*, sp.n., ventral view (ceri and proctiger omitted). **3**, *S. praegnans*, sp.n., dorsal view. **4**, *S. praegnans*, sp.n., ventral view (ceri and proctiger omitted). **5**, *S. monacanthus*, sp.n., dorsal view. **6**, *S. monacanthus*, sp.n., ventral view (ceri and proctiger omitted). **7**, *S. spinibarbis*, sp.n., dorsal view. **8**, *S. spinibarbis*, sp.n., ventral view (ceri and proctiger omitted). **9**, *S. taiwan*, dorsal view. Scale bar = 0.10mm.

**Remarks.** The shape of the wing is similar to *S. cincta*, but the shape of the tergite IX and the gonostylus are different from the other species of the *Saigusaia*.

**Types.** Holotype♂ (ZJFC 010535) CHINA: Zhejiang, Songyang, Zhaoliaoxian Natural Reserve, 1000m, 23 August 2001, Huachao Xu, sweep net. Paratypes (ZJFC 010538, 010539), same place and date as the holotype; (ZJFC 910352, 910570), Fujian Wuyi Mountain National Natural Reserve, September 1989, Chikun, Yang, sweep net.

**Etymology.** The species epithet derive from the Latin *aberrans* = aberrance, referring to this species different from the others of the genus from China.

***Saigusaia praegnans* Wu et Niu, sp. nov.**

(Figs 3, 4, 12)

**Description.** MALE. Lengths: Body: 3.96 mm; wing: 3.79 mm.

**Head.** Vertex and occiput blackish brown, with short black setae. Eye: Oval, with strong postocular bristles. Ocelli three, arranged horizontally, median ocellus smaller than laterals; lateral ocellus separated from median ocellus by about 2 times its own diameter and from eye margin by about 1/3 times its own diameter. Frons blackish brown, bare. Antenna: scape brown, pedicel and apical 3/4 first flagellomere dusk yellow, remainder of flagellomere brown. First flagellomere 3 times as long as wide, sixth flagellomere 3.25 times as long as wide. Face: brown, with several long setae; clypeus yellow, longer than head, with long scattered hairs; palpus yellowish, comprised of 5 segments.

**Thorax.** Mesonotum predominantly blackish brown, with yellow on shoulders. Arostichals ending before 1/3 of mesonotum, pair of pronotal bristles strong. Scutellum blackish brown, with 2 strong bristles. Mediotergite, blackish brown, bare. Proepisternum, meskatepisternum yellow. Mesanepisternum brown, laterotergite blackish brown. Metepisternum yellow.

**Legs.** Slender, predominantly yellow, ventral 1/3 of fore trochanter, entire mid and hind trochanters, ventral said of apical 1/6 of hind femora, basal 1/8 of hind femora brown. Leg ratios: t1:bt1= 1.4, t2: bt2=1.18, t3:bt3=1.66. Fore tibia with comb. Fore tibia with short bristles, mid tibia with four rows of long bristles and hind tibia with two rows of long bristles. The longest bristles about three times as long as tibial diameter. Tibial spurs yellow. Tarsal claws small. Empodia very small.

**Wing.** Slender, 3.0 times as long as wide and slightly deepened from 1/3 apical wing. R-stem, R<sub>1</sub>, R<sub>5</sub>, almost of M<sub>1</sub>, apical 2/3 of M<sub>2</sub>, apical 1/2 of CuA<sub>1</sub>, apical 1/2 of I CuA<sub>2</sub> with dorsal setae. C slightly exceeding tip of R<sub>5</sub>, reaching to basal 1/4 point of wing margin between tips of R<sub>5</sub> and M<sub>1</sub>. Point of furcation of CuA below base of r-m, Lengths of r-m 2.7 times as long as Rs, stem of median fork 2.4 times s long as r-m. Halter yellowish, with scattered long hairs at base.

**Abdomen.** Clothed with more long setae. Sternite I brown, bare. Tergites II–IV with narrow yellow posteromarginal band, remainder of tergites dark brown. Tergite VII and sternite VII about 3/4 as long as sclerites of segment VI. Tergite VIII about 1/2 as long as tergite VII. Sternites II–VII each with median and two pairs of sublateral fold-lines, sternite VIII with median fold-line. Tergite VIII about 3/4 as long as tergite VII. Sternite VIII about 2 times as long as tergite VIII.

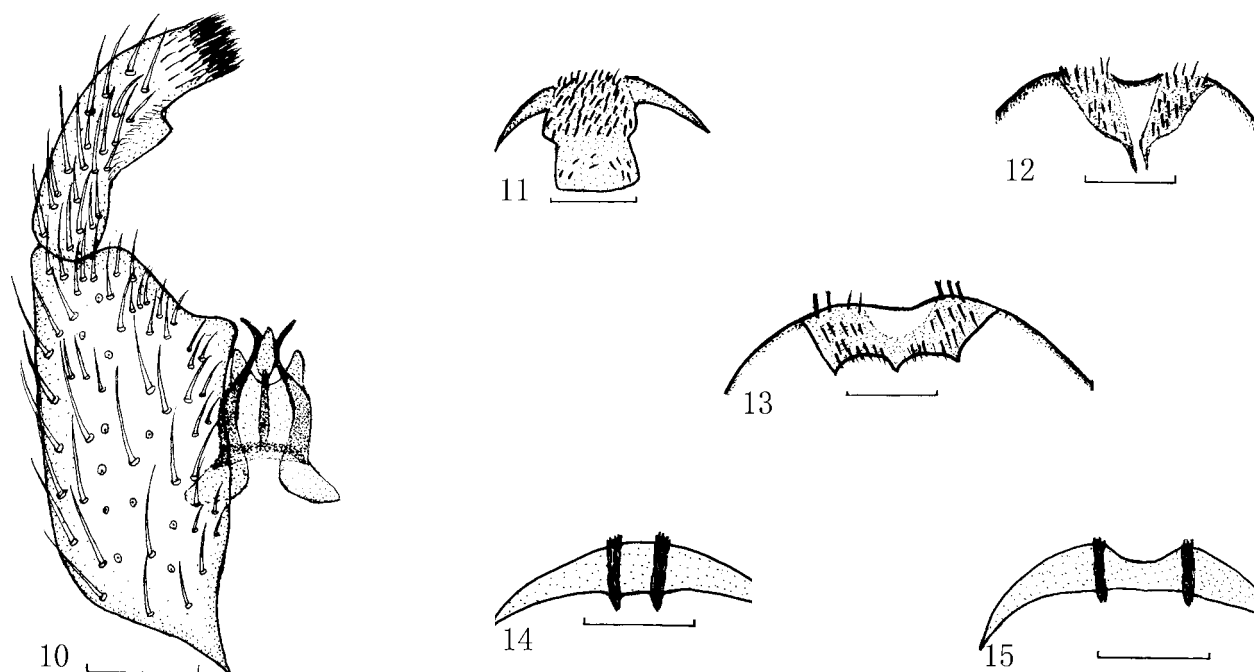
**Hypopygium.** Blackish brown. Tergite IX weakly broadened apically, with more moderate setae and several more strong and long bristles apically; sharply deflexed, narrowed towards apex, with apical emargination in two irregular triangular rows and bearing short spin-like setae; ventral parts of tergite IX strongly tapered. Gonostylus incurved, strongly swollen apically, with three rows of strong and moderate long spine-like setae on dorsal surface and more flattened thin spine-like setae on ventral surface at apex.

**Remarks.** Closest to *S. monacanthus* from Tianmushan Mountain in the color of the thorax, but can be easily distinguished by the ventral part of tergite IX being tapered (rhombic in *S. monacanthus*) and the gonostylus broadened apically with no short black spine.

**FEMALE.** Unknown.

**Types.** Holotype (ZJFC 070412) CHINA: Zhejiang Tianmu Mountain National Natural Reserve, 1090m, 14 November 1998, Mingshui, Zhao, Malaise trap. Paratypes (ZJFC 982421, 982422, 982431, 982428), same place and date as the holotype.

**Etymology.** The species epithet derive from the Latin *praegnans* = expanded, referring to the gonostylus swelled apically.



**FIGURES 10, 11–15.** Male genitalia **10**, *S. taiwan*, ventral view (cerci and proctiger omitted). *S. aberrans*, sp.n., ventral view of tergite IX. **12**, *S. praegnans*, sp.n., ventral view of tergite IX. **13**, *S. monacanthus*, sp.n., ventral view of tergite IX. **14**, *S. spinibarbis*, sp.n., ventral view of tergite IX. **15**, *S. taiwan*, ventral view of tergite IX. Scale bar = 0.10mm.

***Saigusaia monacanthus* Wu et Niu, sp. nov.**

(Figs 5, 6, 13)

**Description.** MALE. Lengths: Body: 4.20 mm; Wing: 3.94 mm.

**Head.** Vertex and occiput blackish brown, with short black setae. Eye: oval, with strong prostocular bristles. Ocelli three, lateral ocellus separated from median ocellus by about 2 times its own diameter and from eye margin by about 1/2 time its own diameter. Frons blackish brown, bare. Antenna: Scape brown; pedicel and first flagellomere, apicla 1/2 of second flagellomere yellow, remainder of the flagellomere brown; each flagellomere subequal, first flagellomere and sixth flagellomere about 3 times as long as wide. Face: brown, with scattered long setae. Clypeus yellow, longer than the head, with scattered long hair. Palpus: yellowish, 5 palpomeres.

**Thorax.** Mesonotum predominantly blackish brown, yellow on shoulders. Arostichals ending before 1/3 of mesonotum, pair of pronotal bristles strong. Scutellum blackish brown, with 4 strong bristles. Mediotergite, blackish brown, bare. Proepisternum, meskatepisternum yellow. Mesanepisternum, laterotergite brown. Metepisternum yellow.

**Legs.** Slender, predominantly yellow, ventral 1/3 of fore trochanter, almost entire mid and hind trochanters, ventral said of apical 1/6 of hind femora, basal 1/8 of hind femur brown. Leg ratios:t1:bt1= 1.60, t2:bt2=1.22, t3:bt3=1.69. Fore tibia with comb and short bristles, mid tibia with four rows of long bristles and

hind tibia with three rows of long bristles. The longest bristles about three times as long as tibial diameter. Tibial spurs yellow. Tarsal claws small. Empodia very small.

**Wing.** Slender, about 3.2 times as long as wide; slightly deepened from 1/3 apical wing. R-stem, R<sub>1</sub>, R<sub>5</sub>, almost of M<sub>1</sub>, apical 1/2 of M<sub>2</sub>, apical 1/4 of CuA<sub>1</sub>, apical 1/2 of 1 CuA<sub>2</sub> with dorsal setae. C slightly exceeding tip of R<sub>5</sub>, reaching to basal 1/4 point of wing margin between tips of R<sub>5</sub> and M<sub>1</sub>. Point of furcation of CuA below base of r-m. Length of r-m 3.0 times as long as Rs, stem of median fork 1.7 times as long as r-m, M<sub>1</sub> 1.2 times as long as M<sub>2</sub>. Halter yellowish, with scattered long hair at base.

**Abdomen.** Clothed with dense long setae. Sternite I brown, bare. Tergites II–IV with a narrow yellow posteromarginal band, remainder of tergites darkish brown. Tergite VII and sternite VII about 3/4 as long as sclerites of segment 6. Tergite VIII about 1/2 as long as tergite VII. Sternites II–VII with pair of submedian fold line and two pairs of sublateral fold lines. Tergite VIII only with submedian fold line.

**Hypopygium.** Blackish brown, Tergite IX broadened apically, with more moderate setae and 6 strong and long bristles apically; sharply deflexed, with apical emargination in two subquadrate rows and bearing short spinose setae; ventral parts of tergite IX broad. Gonostylus slightly swollen at apex, with strong black spine on the dorsal surface beyond 1/2 of gonostylus.

**Remarks.** This species is closest to *Saigusais praegnans* from Tianmu Mountain (Zhejiang Province) based upon color of the thorax, but can be easily distinguished by a spine on the dorsal surface of the gonostylus, the shape of the ventral parts of tergite IX rhombic (strongly tapered in *S. praegnans*).

**FEMALE.** Unknown.

**Types.** Holotype (ZJFC 982427) CHINA: Zhejiang Province Tianmushan National Natural Reserve, 1090m, 14 November 1998, Mingshui Zhao, Malaise trap. Paratypes (ZJFC 982425, 982426, 982430, 982028), same place and date as the holotype.

**Etymology.** The species epithet derive from the Latin *monacanthus* = single spine, referring to gonostylus with one short spine on the dorsal surface.

### ***Saigusais spinibarbis* Wu et Niu, n.sp.**

(Figs 7, 8, 14)

**Description.** MALE. Length: Body: 4.25mm; Wing: 3.90mm.

**Head.** Vertex and occiput blackish brown, with short black setae. Eye: oval, with strong postocular bristles. Ocelli three, lateral ocellus separated from median ocellus by about 1.5 times its own diameter and from eye margin by ca. 0.5 about own diameter. Frons blackish brown. Antenna: scape and pedicel brown. Flagellum: first flagellomere yellowish at extreme base, remainder of the flagellomere brown. First flagellomere and sixth flagellomere 3 times as long as wide, Face: brown, with more long hairs. Clypeus: yellow, longer than the head, with short scattered hairs; Palpus: yellowish, 5 segmented.

**Thorax.** Mesonotum blackish brown, Arostichals ending before middle of mesonotum, pair of pronotal bristles strong. Scutellum blackish brown, with 2 strong bristles. Mediotergite, blackish brown, bare. Proepisternum brown, with some long and strong bristles. Mesanepisternum, meskatopisternum brown. laterotergite blackish brown. Metepisternum brown.

**Legs.** Slender, predominantly yellow, ventral 1/3 of fore trochanter, entire mid and hind trochanters, ventral of 1/10 median and hind femora darkish brown at apex. Leg ratios: 1:bt1= 1.80, t2:bt2=1.26, t3:bt3=1.71. Fore tibia with comb. Fore tibia with short bristles, mid tibia with three rows of long bristles and hind tibia with two rows of long bristles. Longest bristles are about three times as long as tibial diameter. Tibial spurs yellow. Tarsal claws small. Empodia very small.

**Wing.** Hyaline, slender, 2.8 times as long as wide. R-stem, R<sub>1</sub>, R<sub>5</sub>, almost of M<sub>1</sub>, apical 2/3 of M<sub>2</sub>, apical 2/3 of CuA<sub>1</sub>, apical 1/3 of 1 CuA<sub>2</sub> with dorsal setae. C slightly exceeding tip of R<sub>5</sub>, reaching to basal 1/4 point of

wing margin between tips of  $R_5$  and  $M_1$ . Point of furcation of CuA slight beyond base of r-m, Lengths of r-m 2 times as long as  $R_s$ , stem of Median fork 3.2 times long as r-m. Halter yellowish, with scattered and long hairs at base.

**Abdomen.** Clothed with dense long setae. Sternite I brown, bare. Tergites II–IV with narrow yellow posteromarginal band, remainder of tergites darkish brown. Tergite VII and sternite VII about 3/4 as long as sclerites of segment VI. Tergites VIII about 1/2 as long as tergite VII. Sternites II–VII each with median and two pairs of sublateral fold-lines. Sternite VIII with median fold-line. Tergite VIII about 3/4 as long as tergite VII, sternite VIII about 2 times as long as tergite VIII.

**Hypopygium.** Black, Tergite IX weakly broadened apically, with more setae and several more strong and long bristles apically. Posteromarginal portion of epandrium bent downwards ventrally and with two narrow rows of short and strong setae. Gonostylus incurved, slightly peaked apically, a small lamellate edge on dorso-inner margin at 1/2 apical of gonostylus and with two rows of short spine-like setae.

**Remarks.** This species is closest to *S. taiwan* from Taiwan, but can be distinguished by the hairs on the wing (almost of  $M_1$ , apical 2/3 of  $M_2$ , apical 2/3 of  $CuA_1$ , apical 1/3 of  $CuA_2$  with dorsal setae), but hairs of *S. taiwan* ( $M_1$  and apical 1/2 of each  $M_2$ ,  $CuA_1$ ,  $CuA_2$  with dorsal setae) is different. Two rows of short spinulose setae (normal short hairs in *S. taiwan*) on the dorsal of infero-anterior of gonostylus are good characters to distinguish *S. taiwan* from other species of *Saigusaia* Vockeroth.

**Types.** Holotype (ZJFC 982423) CHINA: Zhejiang Qingliang Mountain National Natural Reserve, 1000m, 11 May 2007, Xiaoling Niu, sweep net. Paratypes (ZJFC 070409, 070411, 070413), same place and date as the holotype.

**Etymology.** The species epithet derive from the Latin *spinibarbis* = spine-like hairs, referring to spine-like setae on the gonostylus.

### *Saigusaia taiwan* Saigusa, 1968

(Figs 9, 10, 15)

Material examined: (ZJFC20061730, 20061731, 20061732) CHINA: Sichuan Wanglang National Natural Reserve, 2500m, 25 July 2006, Xiaoling Niu, sweep net.

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