

Three new species and a key to species of the genus *Sinopodisma* Chang, 1940 (Orthoptera, Acridoidea, Catantopidae, Podisminae) from Taiwan, China

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Abstract: Three new species of the genus *Sinopodisma* Chang, 1940 from Taiwan, China are described in this paper. The new species *Sinopodisma huangi* sp. nov. is similar to *Sinopodisma shirakii* (Tinkham, 1936), but differs from the latter by the postocular black band with oblong tape in pronotum and body larger, ♂ 21.3–21.6 mm, ♀ 29.3 mm. The new species *Sinopodisma xui* sp. nov. is allied to *Sinopodisma huangi* sp. nov., but differs from the latter by pronotum without black longitudinal stripe along median keel, hind margin of pronotum with hollow slightly in the middle, black postocular band with twill tape in pronotum and length of interspace of mesosternum equal to the narrowest. The new species *Sinopodisma yangi* sp. nov. is allied to *Sinopodisma formosana* (Shirakii, 1910), but differs from the latter by body slender, postocular band black with oblong tape in pronotum, backward extending to the end of abdomen and length of interspace of mesosternum 1.2 times the narrowest. A key to eight species of the genus from Taiwan is given. Type specimens are deposited in the National Museum of Natural Science, Taichung, Taiwan, China and the Institute of Entomology, Taiwan University, Taipei, Taiwan, China, respectively.

Key words: Orthoptera; Acridoidea; Catantopidae; *Sinopodisma*; new species; Taiwan

The genus *Sinopodisma* Chang, 1940 belongs to the subfamily Podisminae, family Catantopidae, superfamily Acridoidea, including 36 species distributed mainly in East and South China, among them 5 endemic species were found in Taiwan and two species distributed in Ryukyu Islands only (Shiraki, 1910; Tinkham, 1936; Chang, 1940; Bey-Bienko and Mishchenko, 1951; Mishchenko, 1952; Rehn and Randell, 1963; Huang, 1982; You, 1982; Zheng *et al.*, 1985; Zheng and Liang, 1986; Liang, 1988, 1989; Peng and Fu, 1992; Storozhenko, 1993; Zheng *et al.*, 1994; Liang and Lin, 1995; Otte, 1995; Yin *et al.*, 1996; Fu, 1998; Ito, 1999; Zheng and Shi, 2001; Wang *et al.*, 2004a, 2004b; Li *et al.*, 2006; Liang *et al.*, 2007; Zheng *et al.*, 2007; Mao *et al.*, 2011; Eades *et al.*, 2013). We do not include eight species of the genus *Pedopodisma* Zheng, 1980, *i. e.*, *P. dolichopyga* Huang, 1988; *P. epacroptera* Huang, 1988; *P. fopingensis* Zheng *et al.*, 2000; *P. funiushana* Zhang, 1994; *P. furcula* Fu *et al.*, 1996; *P. protrocula* Zheng, 1980; *P. wanxianensis* Zheng *et al.*, 1995 and *P. wuyanlingensis* He *et al.*, 1999, which were placed into the genus *Sinopodisma* by Storozhenko (1993) and Eades *et al.* (2013), because their tegmina very small, not reaching the hind margin of metanotum and veins invisible, so they still belong to the genus *Pedopodisma* Zheng, 1980.

During the identification of grasshopper specimens collected from Taiwan, China, three new species of the genus *Sinopodisma* are discovered and described below. A key to eight species of the genus from Taiwan is given.

1 *Sinopodisma huangi* sp. nov. (Figs. 1–6)
Holotype: ♂, Paratypes 2 ♂♂, Taiwan, Ilan, Taipingshan, 24°29'N, 121°32'E, 1989–VIII–08, collected by Huang Kun–Wei. 1 ♀, Taiwan, Ilan, Tatung, Jentse 24°32'N, 121°29'E, 1989–VIII–08, collected by Huang Kun–Wei.

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Type specimens are deposited in the National Museum of Natural Science, Taichung, Taiwan, China.

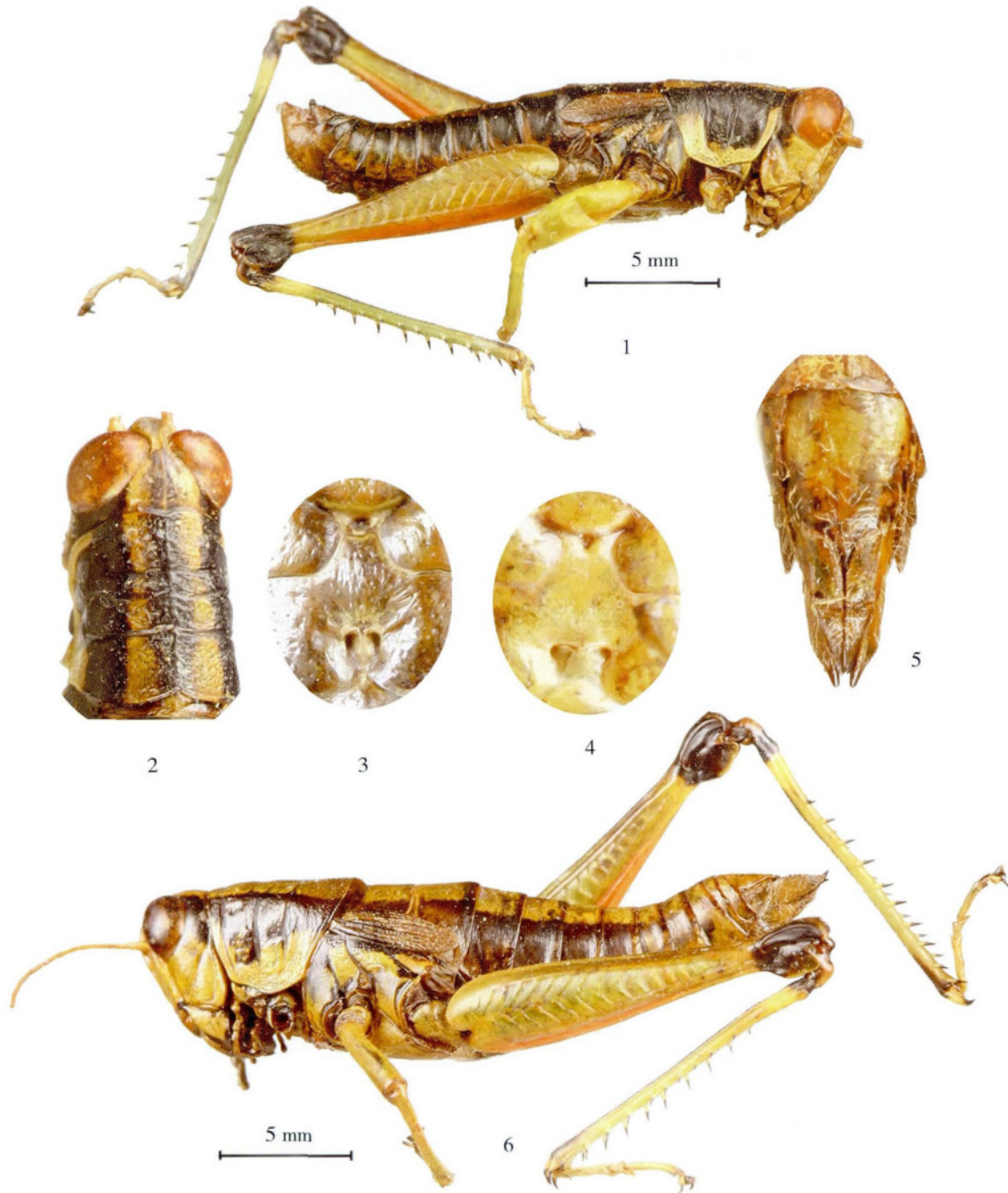
Male: Body median in size. Head larger and short, shorter than pronotum. Face slightly oblique in profile. Antennae filiform. Eyes globose, vertical

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Figs. 1–6 *Sinopodisma huangi* sp. nov.

1. Body, lateral view (♂); 2. Pronotum (♂); 3. Meso-metasternum (♂); 4. Meso-metasternum (♀);
5. End of abdomen, ventral view (♀); 6. Body, lateral view (♀).

diameter 1.5 times horizontal diameter and 2.0 times longer than subocular furrow. Pronotum cylindrical, anterior margin slightly concaved in middle, median keel visible, distinctly cut by three transverse sulci, lateral keels absent, prozona 2.0 times metazona in length, hind margin excised deeply in middle. Prosternal process conical, apex rounded. Length of interspace of mesosternum 1.2 times the narrowest, lateral lobes of metasternum

separated. Tegmina longer, reaching hind margin of first abdominal tergite, length 4 times its width. Upper keel of hind femur smooth, length of hind femur as long as 5.0 times of maximum width, the end of lower knee lobes rounded. Hind tibia with 10 spines on inner and on outer sides, external apical spine absent. Second joint of hind tarsus shorter than first joint. Tympanum distinct, big and rotundity. Tergum of terminal abdomere with longitudinal

groove in middle, furculae invisible. Cercus compressed, almost reaching tip of epiproct, apex curved to inner side. Subgenital plate short-tapered, apex pointed.

Female: Body more robust. Vertical diameter of eyes 1.4 times horizontal diameter and 1.5 times longer than subocular furrow. Prozona 1.7 times metazona in length. Tegmina shorter, not reaching hind margin of the 1st abdominal tergite, length 3 times its width. Length of hind femur 4.8 times its maximum width. Cercus short-conical, not reaching end of epiproct. Ovipositor valve thick and short, hooked in end, with small teeth on outer margin.

Coloration: Body brown. Antennae yellow. Pronotum yellowish-brown, with a black longitudinal band along median keel. Postocular band black with oblong tape in pronotum. Tegmina brown. Hind femur yellowish-brown, orange-red on lower side. Hind tibia green. Abdomen yellowish-brown, with dark broad longitudinal stripe on both sides. Subgenital plate brown.

Measurement (mm): Length of body: ♂ 21.3 – 21.6, ♀ 29.3. Length of tegmina: ♂ 3.9 – 4.1, ♀ 5.2. Length of pronotum: ♂ 4.1 – 4.6, ♀ 6.0. Length of hind femur: ♂ 11.3 – 12.8, ♀ 16.3.

Diagnosis: The new species is similar to *Sinopodisma shirakii* (Tinkham, 1936), but differs from the latter by postocular black band with oblong tape in pronotum and body larger, ♂ 21.3 – 21.6 mm, ♀ 29.3 mm.

Etymology: The specific epithet is named after Mr. Huang Kun-Wei for commemorating his help to collect the type specimens.

2 *Sinopodisma xui* sp. nov. (Figs. 7–12)

Holotype: ♀, Taiwan, Nantou, Huishun, 24° 06' N, 121° 02' E, 1998-III-29, collected by Xu Chong-Bin.

Type specimen is deposited in the Institute of Entomology, Taiwan University, Taipei, Taiwan, China.

Female: Body more robust. Width of frontal ridge between antennae narrower than minimum distance between two eyes in vertex. Vertical diameter of eyes 1.6 times horizontal diameter and 1.9 times longer than subocular furrow. Antennae 23 segmented, length of joint 3.6 times width in middle part. Prozona 1.6 times metazona in length. Anterior margin with distinct hollow in the middle times width in middle part. Eyes globose, vertical diameter 1.3 times horizontal diameter and 2.0 times longer than subocular furrow. Pronotum cylindrical, anterior margin slightly concaved in

and hind margin with hollow slightly in middle. Prosternal process conical, apex acute. Tegmina shorter, not reaching hind margin of first abdominal tergite, length 3.1 times its width. Length of interspace of mesosternum equal to the narrowest. Length of hind femur as long as 5.2 times its maximum width. Hind tibia with 10 spines on inner and 9 spines on outer sides, external apical spine absent. Epiproct shield shaped, base with longitudinal groove in middle. Hind margin of subgenital plate pointed in middle. Cercus short-conical, not reaching end of epiproct. Ovipositor valve thick, hooked in end, lower valve shorter than upper valve distinctly.

Coloration: Body yellowish brown. Antennae yellow. Eye dark brown. Pronotum without black longitudinal stripe along median keel. Black postocular band extending to end of abdomen, with twill tape in pronotum. Tegmina brown. Hind femur yellowish brown, lower side red, knee black. Hind tibiae green, base black, near base with a yellow ring. Hind tarsus yellowish brown.

Measurement (mm): Length of body: ♀ 31.1. Length of tegmina: ♀ 5.6. Length of pronotum: ♀ 6.6. Length of hind femur: ♀ 18.2.

Male unknown.

Diagnosis: The new species *Sinopodisma xui* sp. nov. is allied to *Sinopodisma ilanensis* sp. nov., but differs from the latter by pronotum without black longitudinal stripe along median keel, hind margin of pronotum with hollow slightly in middle, black postocular band with twill tape in pronotum, length of interspace of mesosternum equal to the narrowest.

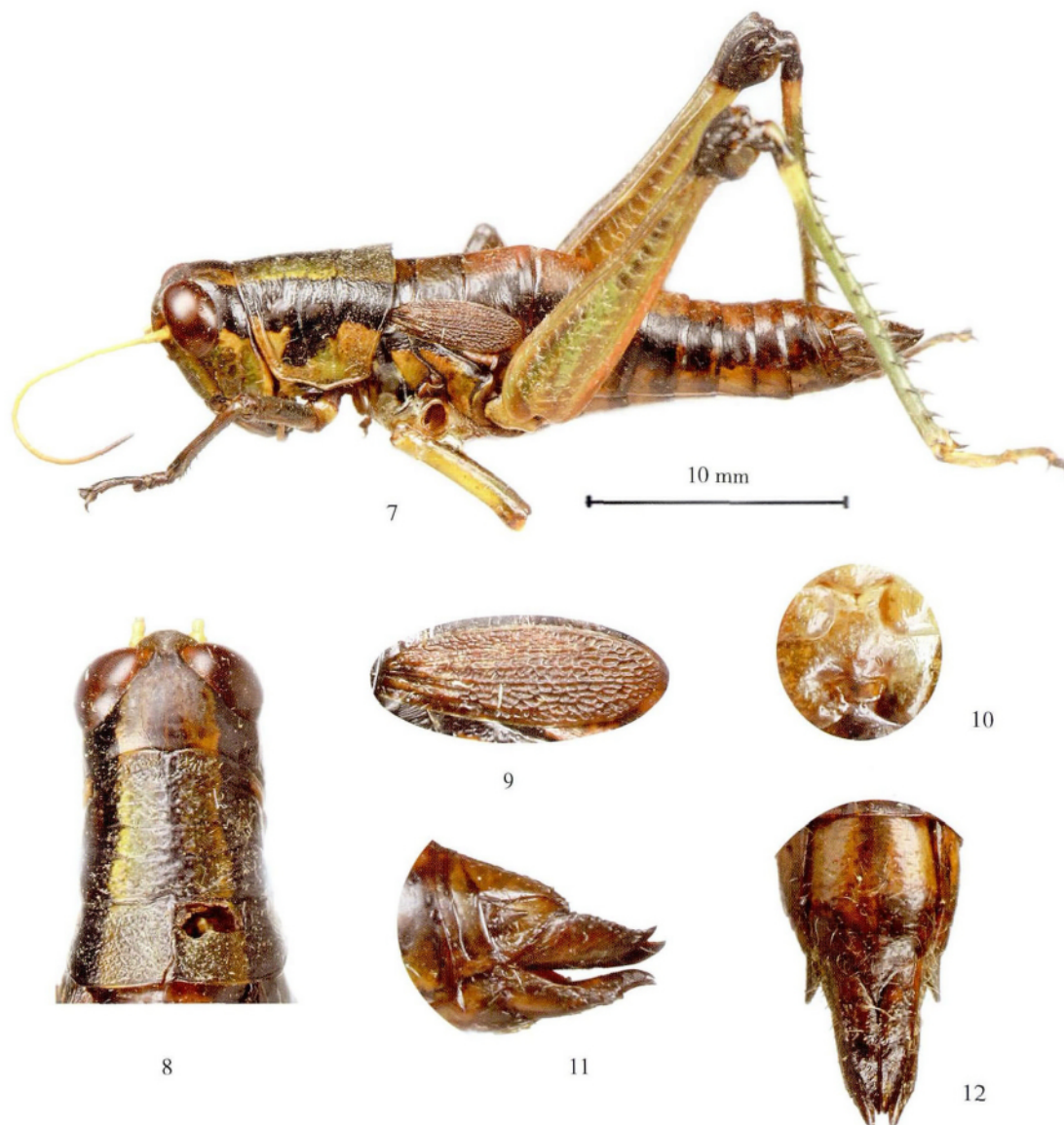
Etymology: The specific epithet is named after Mr. Xu Chong-Bin for commemorating his help to collect the type specimen.

3 *Sinopodisma yangi* sp. nov. (Figs. 13–18)

Holotype: ♂ Taiwan, Nantou, Huishun, 24° 06' N, 121° 02' E, 1992-VII-11, collected by Yang Wan-Tong.

Type specimen is deposited in the National Museum of Natural Science, Taichung, Taiwan, China.

Male: Body smaller and slender. Head larger and short, shorter than pronotum. Face oblique in profile. Frontal ridge flat, width between antennae equal minimum distance between two eyes in vertex. Antennae filiform, 22 segmented, length of joint 3.8 middle, median keel visible, distinctly cut by three transverse sulci, lateral keels absent, prozona 2.1 times metazona in length, hind margin excised slightly in middle. Prosternal process conical, apex



Figs. 7–12 *Sinopodisma xui* sp. nov. (♀)

7. Body, lateral view; 8. Head and pronotum, dorsal view; 9. Tegmen, lateral view; 10. Meso-metasternum ventral view; 11. End of abdomen, lateral view; 12. End of abdomen, ventral view.

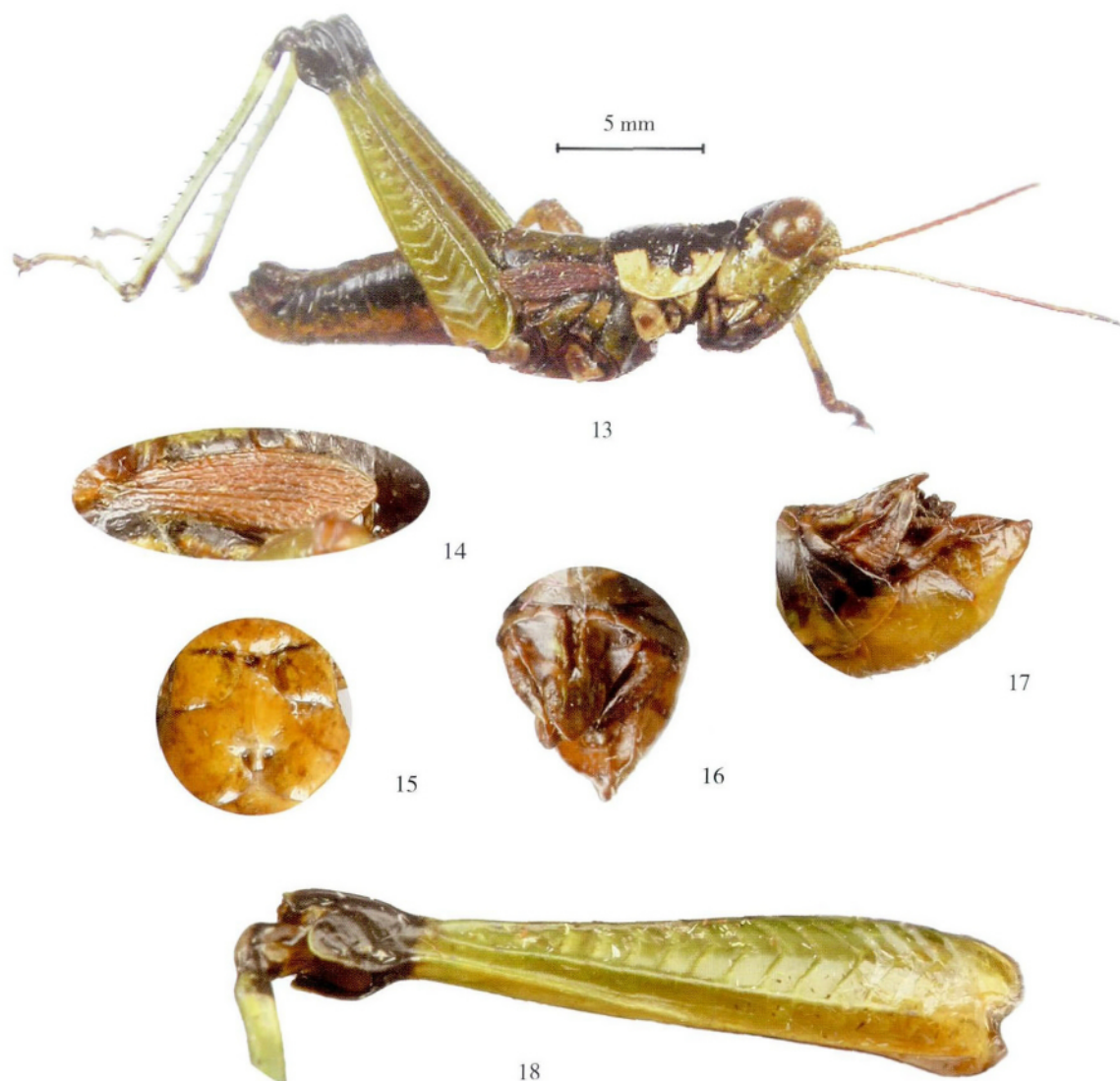
pointed. Length of interspace of mesosternum 1.2 times the narrowest, lateral lobes of metasternum separated distinctly. Tegmina longer, extending over hind margin of first abdominal tergite slightly, length 3 times maximum width. Upper keel of hind femur smooth, length of hind femur 5.3 times its maximum width, end of lower knee lobes rounded. Hind tibia with 9 spines on inner and on outer sides, external apical spine absent. Second joint of hind tarsus shorter than first joint. Tympanum distinct, big and rotundity. Base part epiproct with longitudinal groove in middle, furculae invisible. Cercus compressed, not reaching tip of epiproct, apex curved to inner side. Subgenital plate short-tapered.

Coloration: Body yellowish brown. Eyes brown. Antennae yellowish brown. Postocular band black, with oblong tape in pronotum, backward extending to end of abdomen. Lateral lobe of pronotum yellow. Hind femur green, knee black. Hind tibiae green, base black. Hind tarsus yellowish brown.

Measurement (mm): Length of body: ♂ 21.6. Length of tegmina: ♂ 4.2. Length of pronotum: ♂ 4.5. Length of hind femur: ♂ 12.3.

Female unknown.

Diagnosis: The new species *Sinopodisma yangi* sp. nov. is allied to *Sinopodisma formosana* (Shirakii, 1910), but differs from the latter by body slender, postocular band black with oblong tape in



Figs. 13 – 18 *Sinopodisma yangi* sp. nov. (♂)
 13. Body , lateral view; 14. Tegmen; 15. Meso-metasternum; 16. End of abdomen , dorsal view;
 17. End of abdomen , lateral view; 18. Hind femur , lateral view.

pronotum , backward extending to end of abdomen , length of interspace of mesosternum 1.2 times the narrowest.

Etymology: The specific epithet is named after Mr. Yang Wan-Tong for commemorating his help to collect the type specimen.

Key to eight species of the genus *Sinopodisma* Chang , 1940 from Taiwan

1. Tegmina narrow leaf-like , its length 2.5 – 3.0 times width , rounded at apex. Cercus of male incurved , upper margin relatively depressed , apex rounded , Post ocular band distinct , usually extends to abdomen 2
2. Tegmina wide oval , its length 2.0 times width , apex obliquely truncated downward. Cercus of male relatively straight , apex widely rounded or truncated , Post ocular band distinct or indistinct , but not extends to abdomen 7
3. Body larger , length in male 21.3 – 32.8 mm , in female 33.5 – 40.0 mm 3
3. Body smaller , length in male 16.8 – 19.5 mm , in female 20.0 – 24.0 mm *S. shirakii*
4. Hind femur orange-red or yellowish-red on lower side or inner side 4
4. Hind femur yellow , not orange-red on lower side 5
4. Pronotum with black longitudinal stripe along median keel. Hind margin of pronotum with hollow deeply in middle. Black postocular band with oblong tape in pronotum *S. huangi* sp. nov.
4. Pronotum without black longitudinal stripe along median keel. Hind margin of pronotum with hollow slightly in middle. Black postocular band with twill tape in pronotum *S. xui* sp. nov.

5. Pronotum with wide narrower black stripe along median carina, abdomen without yellow longitudinal stripe along dorsal median carina. Hind margin of pronotum with distinct hollow in middle 6
 Pronotum with wide black stripe along median carina and yellow longitudinal stripe along dorsal median carina of abdomen. Hind margin of pronotum with hollow slightly in middle. *S. splendida*
6. Body robust, postocular black band with twill tape in pronotum, backward not extending to end of abdomen, length of interspace of mesosternum 1.8 times the narrowest *S. formosana*
 Body slender, postocular black band with oblong tape in pronotum, backward extending to end of abdomen, length of interspace of mesosternum 1.2 times the narrowest. *S. yangi* sp. nov
7. Body smaller, length of body in male 15.6 – 19.0 mm and in female 20.0 – 21.0 mm. Post ocular band distinct. ...
 *S. kawakamii*
 Body larger, length of body in male 21.5 mm and in female 24.0 – 31.0 mm. Post ocular band indistinct.
 *S. kodamae*

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中国台湾蹦蝗属三新种及种检索表 (直翅目 蝗总科 斑腿蝗科 秃蝗亚科)

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摘要: 记述了中国台湾蹦蝗属 *Sinopodisma* Chang, 1940 3 个新种。新种黄氏蹦蝗 *Sinopodisma huangi* sp. nov. 同素木蹦蝗 *S. shirakii* (Tinkham, 1936) 近似, 但前胸背板的眼后带下缘具长方形黑斑和体较大, 体长雄性为 21.3 ~ 21.8 mm, 雌性 29.3 mm。新种徐氏蹦蝗 *Sinopodisma xui* sp. nov. 近似黄氏蹦蝗 *Sinopodisma huangi* sp. nov. 不同之处为前胸背板沿中隆线缺黑色纵带纹, 后缘中央具浅的凹陷, 前胸背板黑色眼后带下方具倾斜纹, 腹板中隔长等于最狭处。新种杨氏蹦蝗 *Sinopodisma yangi* sp. nov. 近似台湾蹦蝗 *formosana* (Shiraki, 1910), 不同之处为体较细, 黑色眼后带在前胸背板下缘具长方形突出带, 向后到达腹部末端, 腹板中隔长为最狭处的 1.2 倍。列出了产于台湾的蹦蝗属 8 个种的检索表。

关键词: 直翅目; 蝗总科; 斑腿蝗科; 蹦蝗属; 新种; 台湾

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附录: 新种简记

1. 黄氏蹦蝗 *Sinopodisma huangi* sp. nov. (图 1~6)

正模: ♂, 副模 2 ♂♂, 1 ♀, 台湾宜兰, 1989-VIII-08, 黄坤伟采。

词源: 新种种名源自模式标本采集者: 黄坤伟先生。

模式标本存于自然科学博物馆, 台湾台中, 中国。

2. 徐氏蹦蝗 *Sinopodisma xui* sp. nov. (图 7~12)

正模: ♀, 台湾, 1998-III-28, 徐崇斌采。

词源: 新种种名源自模式标本采集者: 徐崇斌先生。

模式标本存于台湾大学昆虫学研究所, 台湾台北, 中国。

3. 杨氏蹦蝗 *Sinopodisma yangi* sp. nov. (图 13~18)

正模: ♂, 台湾, 南投, 惠蓀 1992-VII-11, 杨万琮采。

词源: 新种种名源自模式标本采集者: 杨万琮先生。

模式标本存于自然科学博物馆, 台湾台中, 中国。

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