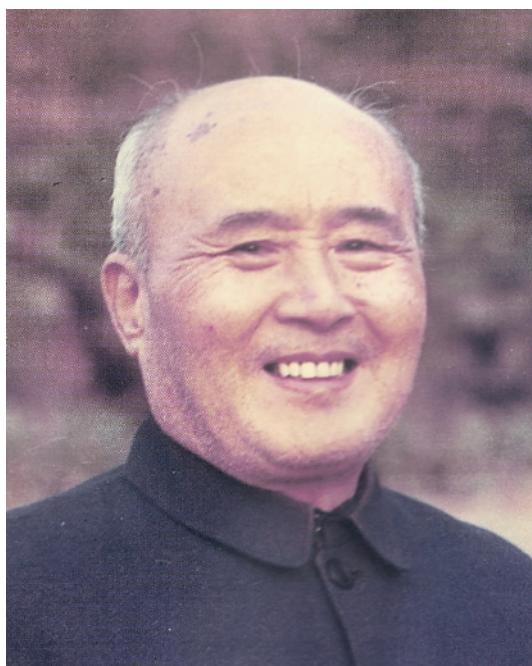


Three new species of the genus *Niitakacris* Tinkham, 1936 (Orthoptera, Acridoidea, Catantopidae, Podisminae) with a key to five species of the genus from Taiwan, China

YIN Xiang-Chu^{1 2 3 *}, YE Bao-Hua³, DANG Yan¹

(1. College of Life Sciences, Hebei University, Baoding, Hebei 071002, China;
2. Northwest Plateau Institute of Biology, Chinese Academy of Sciences, Xining 810001, China;
3. College of Plant Protection, Shandong Agricultural University, Tai'an, Shandong 271018, China)



Prof. XIA Kai-Ling (1916–2013)

This paper is dedicated to the memory of Professor XIA Kai-Ling on the centenary of his birth.

Prof. Xia had dedicated most of his career to the systematics studies of Orthoptera from China
and trained a whole generation of Chinese systematists of orthopteroid insects
including the senior author of this article.

Abstract: Three new species of the genus *Niitakacris* Tinkham, 1936 from Taiwan, China are described in the present paper, including *N. arishanensis* sp. nov., *N. xiai* sp. nov., and *N. taiwanensis* sp. nov. *N. arishanensis* sp. nov. differs from all known species of the genus by the hind femur not red on inner side and maximum width of basal part 4 times width of apical part in cercus of male. *N. xiai* sp. nov. is similar to *N. rosaceanum* (Shiraki, 1910) and *Niitakacris taiwanensis* sp. nov., but differs from the two species by the length of interspace of mesosternum longer than minimum width and tegmina not reaching the hind margin of first abdominal tergite. *N. taiwanensis* sp. nov. is similar to *N. rosaceanum* (Shiraki, 1910), but differs from the latter by eye smaller, vertical diameter 1.4 times subocular furrow; furculae separated; longitudinal groove at base of epiproct shorter, not reaching to the middle, apex rounded. A key to all five 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; Catantopidae; *Niitakacris*; new species; Taiwan

Funding program: National Natural Science Foundation of China (31372153)

* Corresponding author, E-mail: yxch@hbu.edu.cn; yxch@sdau.edu.cn

Received: 2014-11-24; Accepted: 2015-01-12

The genus *Niitakacris* Tinkham, 1936 (Podisminae, Catantopidae, Acridoidea, Orthoptera) is only known from Taiwan, China, comprising two known species from Taiwan, China, i.e., *N. goganzanensis* Tinkham, 1936 and *N. rosaceanum* (Shiraki, 1910) (Tinkham, 1936; Rehn and Randell, 1963; Otte, 1995; Yin et al., 1996; Li et al., 2006; Eades and Otte, 2014). During the identification of grasshopper specimens collected from Taiwan, China, three new species of the genus *Niitakacris* Tinkham were found to be new to science and are described herein. A key is given to all five known species of the genus.

Niitakacris Tinkham, 1936

Tinkham, 1936. *Trans. Nat. Hist. Soc. Formosa*, 26: 392.

Rehn et Randell, 1963. *Proc. Acad. Nat. Sci. Philad.*, 115: 10.

Otte, 1995. Orthoptera Species File, 4: 430.

Yin, Shi et Yin, 1996. Synonymic Catalogue of Grasshoppers and their Allies of the World (Orthoptera: Caelifera): 438.

Li et al., 2006. *Fauna Sinica, Insecta*, 43: 348.

Type species: *Niitakacris goganzanensis* Tinkham, 1936.

Body small in size, robust. Head shorter than pronotum. Face slightly oblique in profile. Antennae filiform, apex not reaching hind margin of pronotum. Eyes globose, vertical diameter longer than subocular furrow. Pronotum cylindrical, anterior margin straight, median keel visible, distinctly cut by three transverse sulci, lateral keels present, prozona longer than metazona, hind margin broadly and deeply emarginated. Prosternal process conical, apex rounded. The interspace of mesosternum wider than long, rarely narrow, lateral lobes of metasternum separated. Tegmina long oval, reaching or extending over first abdominal tergite. The upper keel of hind femur smooth, with small apical spine, lower knee lobes rounded distally. Hind tibia without external apical spine. Tympanum distinct, oval. Epiproct with median longitudinal groove not reaching the middle of epiproct. Furculae large, separated. Cercus compressed, maximum width of basal part 4 times width of apical part, posteriorly not reaching the tip of epiproct, apex obtusely rounded, curved inward. Subgenital plate short-tapered, apex obtuse.

This genus obtains 5 species (including 3 new species), they are endemic species of Taiwan.

1 *Niitakacris arishanensis* sp. nov. (Figs. 1–5)

Holotype: ♂, Taiwan, Arishan 23°45'N, 120°

50'E, 1919-IX-18, collected by T. Maa.

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

Male: Body small in size. Head shorter than pronotum. Face slightly oblique in profile. Antennae filiform. Eyes globose, vertical diameter 1.4 times horizontal diameter and 1.6 times subocular furrow. Pronotum cylindrical, anterior margin straight, median keel visible, distinctly cut by three transverse sulci, lateral keels present, prozona 1.6 times as long as metazona, hind margin broadly and deeply emarginated. Prosternal process conical, apex rounded. The interspace of mesosternum much wider than long, with narrowest width 1.5 times as long as length; lateral lobes of metasternum separated. Tegmina length 2 times its width, reaching the hind margin of first abdominal tergite. The upper keel of hind femur smooth, with small apical spine, length of hind femur 4.0 times as long as maximum width; lower knee lobes rounded distally. Hind tibia with 10 spines on inner side and 8 spines on the outer side; external apical spine absent. Second metatarsomere shorter than the first. Tympanum distinct, big and rounded. Epiproct with median longitudinal groove not reaching the middle of epiproct. Furculae large, separated. Cercus compressed, maximum width of basal part 4 times width of apical part, posteriorly not reaching the tip of epiproct, apex obtusely rounded, curved inward. Subgenital plate short-tapered, apex obtuse.

Body dark brown. Tegmina dark brown. Hind femur dark brown on inner and outer sides, and red ventrally. Hind tibiae yellowish orange.

Measurement (in mm): Length of body: ♂ 15.3. Length of tegmina: ♂ 2.4. Length of pronotum: ♂ 3.6. Length of hind femur: ♂ 9.6.

Female unknown.

Diagnosis. The new species differs from all known species of the genus in having hind femur not red on inner side and maximum width of basal part 4 times width of apical part in cercus of male.

Etymology: The specific epithet refers to the type locality, Arishan.

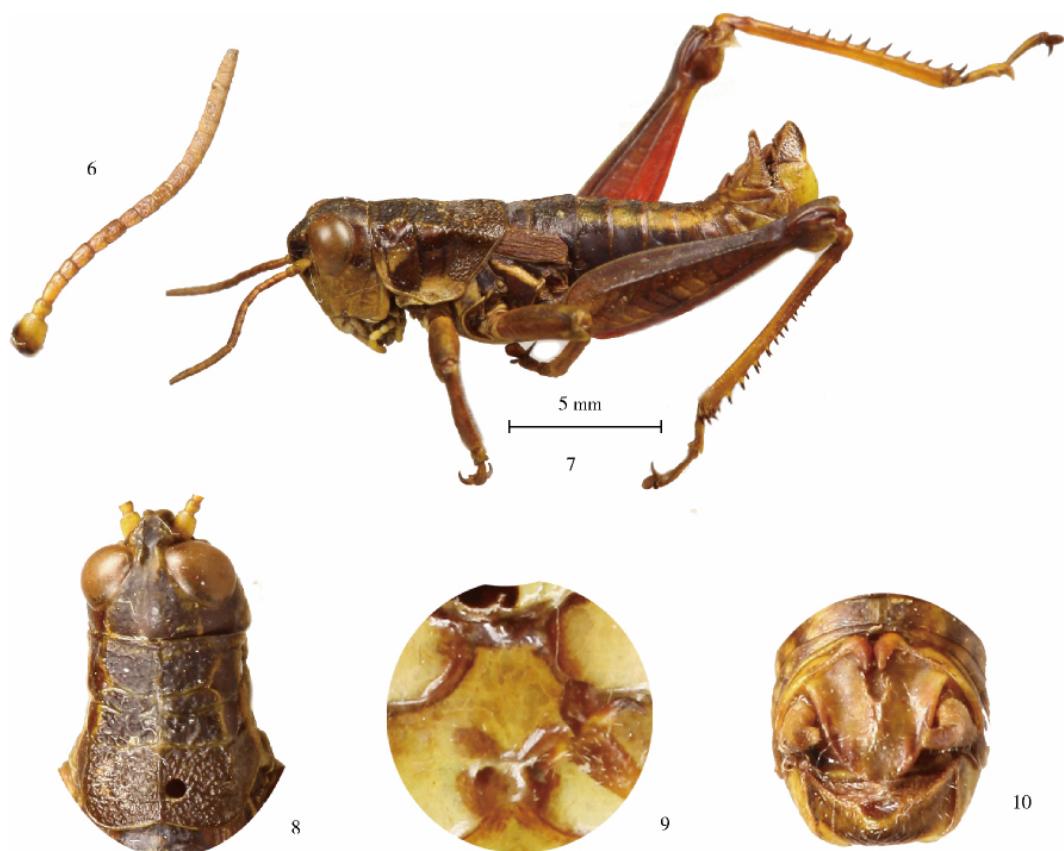
2 *Niitakacris xiai* sp. nov. (Figs. 6–10)

Holotype: ♂, Taiwan, Nantou, Patungkuau, 23°29'N, 120°59'E, 1990-VI-20–22, collected by J. T. Yang.



Figs. 1–5 *Niitakacris arishanensis* sp. nov. (♂)

1: Body, lateral view; 2. Head and pronotum; 3. Meso-metasternum; 4. End of abdomen, dorsal view; 5. End of abdomen, lateral view.



Figs. 6–10 *Niitakacris xiai* sp. nov. (♂)

6. Antennae; 7. Body, lateral view; 8. Head and pronotum, dorsal view; 9. Meso-metasternum; 10. End of abdomen, dorsal view.

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

Male: Body small in size. Head shorter than pronotum. Face slightly oblique in profile. Antennae filiform , 22 segmented. Eyes globose , vertical diameter 1. 4 times horizontal diameter and 1. 6 times subocular furrow. Pronotum cylindrical , anterior margin straight , median keel visible , distinctly cut by three transverse sulci , lateral keels present; prozona 1. 3 times as long as metazona , hind margin deeply excised in middle. Prosternal process conical , apex rounded. The interspace of mesosternum 1. 2 times the narrowest width; lateral lobes of metasternum separated. Tegmina 2. 4 times as long as , not reaching the hind margin of first abdominal tergite. The upper keel of hind femur smooth , length of hind femur 3. 6 times as long as maximum width; lower knee lobes rounded apically. Hind tibia with 9 spines on inner and 8 spines on outer sides; external apical spine absent. Second metatarsomere shorter than the first. Tympanum distinct , big and rounded. Epiproct with median longitudinal groove , not reaching the mid-point of epiproct. Furculae large , separated. Cercus

compressed , maximum width of basal part 3 times width of apical part , not reaching the tip of epiproct , apex obtusely rounded , curved inward. Subgenital plate short-tapered , apex obtuse.

Body dark brown. Tegmina dark brown. Hind femur dark brown , inner and lower sides red. Hind tibiae yellowish orange.

Measurement (in mm) : Length of body: ♂ 17.2. Length of tegmina: ♂ 2.5. Length of pronotum: ♂ 5.0. Length of hind femur: ♂ 9.8.

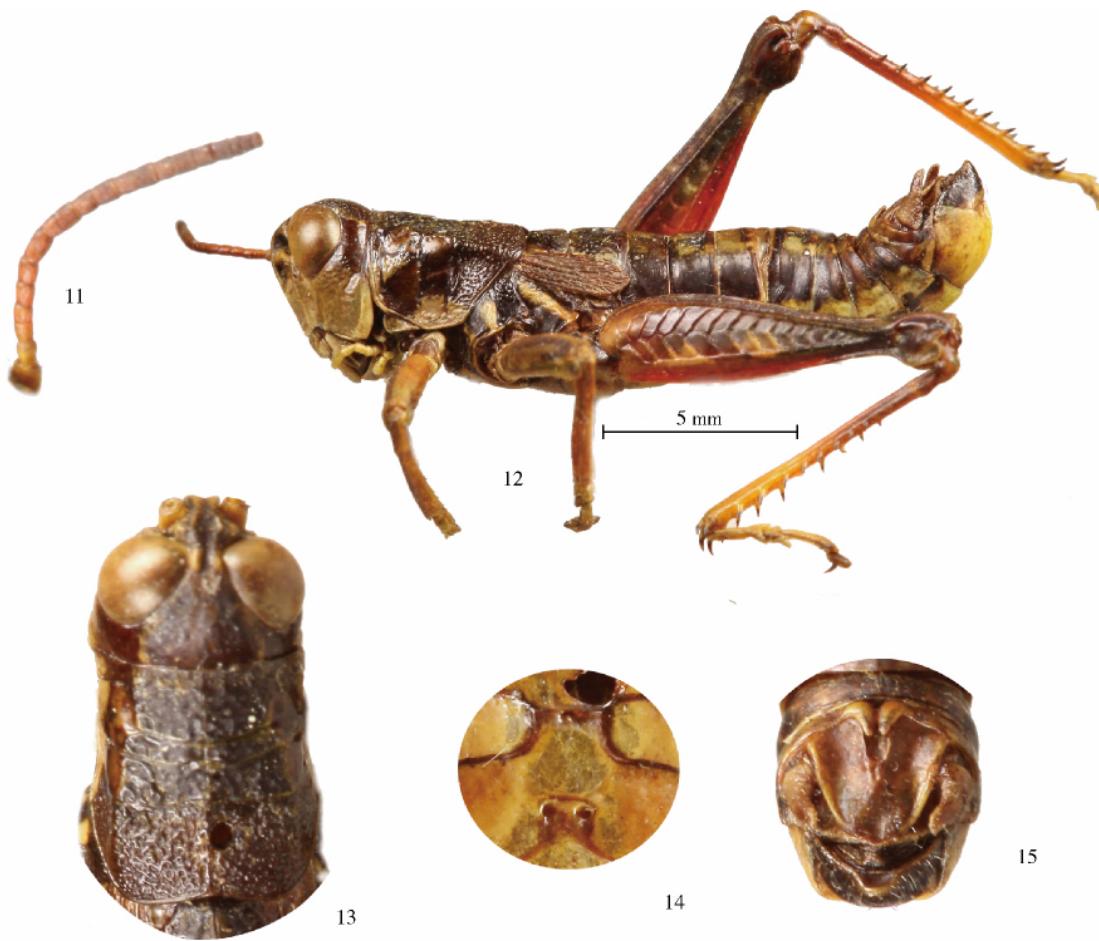
Female unknown.

Diagnosis: The new species is allied to *N. rosaceanum* (Shiraki , 1910) and *Niitakacris taiwanensis* sp. nov. , but differs from the latter two species in the length of interspace of mesosternum longer than minimum width and tegmina not reaching the hind margin of first abdominal tergite.

Etymology: The species is named after Prof. Xia Kai-Ling in honor of his contribution to entomology.

3 *Niitakacris taiwanensis* sp. nov. (Figs. 11 – 15)

Holotype: ♂ , Taiwan , Nantou , Patungkuan , 23°29'N , 120°59'E , 1996-VI-20-22 , collected by J. T. Yang.



Figs. 11 – 15 *Niitakacris taiwanensis* sp. nov. (♂)

11. Antennae; 12. Body , lateral view; 13. Head and pronotum , dorsal view; 14. Meso-metasternum; 15. End of abdomen , dorsal view.

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

Male: Body small in size. Head shorter than pronotum. Face slightly oblique in profile. Antennae filiform , 20 segmented. Eyes globose , vertical diameter 1. 4 times horizontal diameter and 1. 5 times subocular furrow. Pronotum cylindrical , anterior margin straight , median keel visible , distinctly cut by three transverse sulci , lateral keels present; prozona 1. 4 times as long as metazona; hind margin excised slightly in middle. Prosternal process conical , apex rounded. The interspace of mesosternum wide , with narrowest width 1. 2 times its length; lateral lobes of metasternum separated. Tegmina longer , 2. 9 times as long as wide , extending beyond hind margin of first abdominal tergite. The upper keel of hind femur smooth , with a small apical spine; length of hind femur 4. 0 times as long as maximum width , lower knee lobes rounded distally. Hind tibia with 9 spines on inner side and 8 spines on outer side; external apical spine absent. Second metatarsomere shorter than the first. Tympanum distinct , big and rounded. Epiproct with

median longitudinal groove not reaching the middle of epiproct. Furculae large , separated. Cercus compressed , maximum width of basal part 3 times width of apical part , not reaching the tip of epiproct , apex slightly acute , curved inward. Subgenital plate short conical , apex obtuse.

Body brown. Eyes brown. Antennae yellowish brown. Postocular band black , with oblong tape on pronotum , backward extending to the end of abdomen. Hind femur brown , basal half red on inner side , lower side red. Hind tibiae orange.

Measurement (in mm) : Length of body: ♂ 17.9. Length of tegmina: ♂ 2.7. Length of pronotum: ♂ 4.8. Length of hind femur: ♂ 10.2.

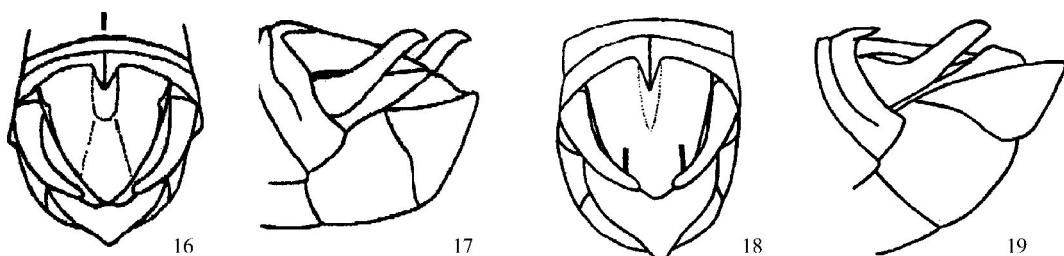
Female unknown.

Diagnosis: The new species is allied to *N. rosaceanum* (Shiraki , 1910) , but differs from the latter in having eye smaller , vertical diameter 1. 4 times subocular furrow; furculae separated and median longitudinal groove of epiproct shorter , not reaching to the middle , apex of epiproct rounded.

Etymology. The specific epithet is named after the type locality , Taiwan.

Key to the species of the genus *Niitakacris* Tinkham , 1936

1. Hind femur red on inner side. Width of basal part 2 – 3 times width of apical part in cercus of male.
Hind femur dark brown on inner side. Width of basal part 4 times width of apical part in cercus of male (Figs. 1 , 5) *N. arisanensis* sp. nov.
2. Furculae of the 10th abdominal tergite in male longer. Cercus shorter , lower angle of apex obtusely rounded.
Furculae of the 10th abdominal tergite in male shorter. Cercus longer , lower angle of apex acuter (Figs. 16 , 17) *N. goganzanensis*
3. Length of interspace of mesosternum shorter than minimum width. Tegmina extending over the hind margin of first abdominal tergite.
Length of interspace of mesosternum longer than minimum width. Tegmina not reaching the hind margin of first abdominal tergite. (Figs. 9 , 10) *N. xiai* sp. nov.
4. Eye larger , vertical diameter 2.0 times subocular furrow. Furculae contiguous. Longitudinal groove at base of epiproct longer , reaching to the middle (Figs. 18 , 19) *N. rosaceanum*
Eye smaller , vertical diameter 1.4 times subocular furrow. Furculae separated. Longitudinal groove at base of epiproct shorter , not reaching to the middle (Figs. 14 , 15) *N. taiwanensis* sp. nov.



Figs. 16 – 19 End of abdomen of *Niitakacris goganzanensis* and *N. rosaceanum*
16 , 17: *N. goganzanensis*; 18 , 19: *N. rosaceanum* (adopted from Tinkham , 1936) . 16 , 18: Dorsal view; 17 , 19: Lateral view.

References

- Eades DC , Otte D , 2014. Orthoptera Species File Online. Version 5.0 / 5.0. [2014.10]. <<http://Orthoptera.Species.File.org>> .
Li HC , Xia KL , Bi DY , Jin XB , Huang CM , Yin XC , Zheng ZM , Lian

ZM , You QJ , Zhang FL , Li TS , 2006. Fauna Sinica , Insecta. Orthoptera , Acridoidea , Catantopidae. Science Press , Beijing. 43: 348 – 352 , 681.

Otte D , 1995. Orthoptera Species File. Orthopterists' Society USA. 4: 430.

- Rehn JAG, Randell RL, 1963. A preliminary analysis of the lines of the super-tribe Melanoplini (Orthoptera: Acrididae, Cyrtacanthacridinae). *Proc. Acad. Nat. Sci. Philadelphia*, 115: 1–32.
- Shiraki T, 1910. Acrididen Japans. Tokyo: 75.
- Tinkham ER, 1936. A new genus and three new species of the group Podismae from Formosa with key and faunistic notes (Orth.: Acrididae). *Trans. Nat. Hist. Soc. Formosa*, 26: 389–406.
- Yin XC, Shi JP, Yin Z, 1996. A Synonymic Catalogue of Grasshoppers and their Allies of the World (Orthoptera: Caelifera). China Forestry Publishing House, Beijing. 438.

中国台湾尼蝗属三新种及种检索表 (直翅目, 蝗总科, 斑腿蝗科, 秃蝗亚科)

印象初^{1 2 3 *}, 叶保华³, 党琰¹

(1. 河北大学生命科学学院, 河北保定 071002; 2. 中国科学院西北高原生物研究所, 西宁 810001;
3. 山东农业大学植物保护学院, 山东泰安 271018).

摘要: 记述了中国台湾尼蝗属 *Niitakacris* Tinkham, 1936 的 3 新种。新种阿里山尼蝗 *Niitakacris arishanensis* sp. nov. 后足股节内侧非红色和雄性尾须基部的最大宽度为端部宽度的 4 倍, 可与本属所有已知种相区别。新种夏氏尼蝗 *Niitakacris xiai* sp. nov. 与红胫尼蝗 *N. rosaceum* 和台湾尼蝗 *Niitakacris taiwanensis* sp. nov. 近似, 不同之处为中胸腹板中隔的长度大于最狭处, 前翅不到达腹部第 1 节背板后缘。新种台湾尼蝗 *Niitakacris taiwanensis* sp. nov. 与红胫尼蝗 *N. rosaceum* 近似, 不同之处为复眼较小, 纵径为眼下沟长的 1.4 倍; 两尾片分开; 肛上板基部纵沟较短, 不到达中部, 沟端圆, 不尖。列出了尼蝗属全部 5 个种的检索表。

关键词: 直翅目; 斑腿科; 尼蝗属; 新种; 台湾

中图分类号: Q969 文献标识码: A 文章编号: 0454-6296(2015)03-0335-06

附录: 新种简记

阿里山尼蝗 *Niitakacris arishanensis* sp. nov. (Figs. 1–5)

正模: ♂, 台湾 阿里山, 1919-IX-18, T. Maa 采。

词源: 新种名源自模式标本产地地名“Arishan”。

模式标本存于台湾大学昆虫学研究所, 台北, 台湾, 中国。

夏氏尼蝗 *Niitakacris xiai* sp. nov. (Figs. 6–10)

正模: ♂, 台湾 南投 八通关 23°29'N, 120°59'E, 1990-VI-20–22, 楊正泽采。

词源: 新种名源自夏凯龄教授的姓“Xia”, 对他为昆虫学做出的贡献表示敬意!

模式标本存于自然博物馆, 台中, 台湾, 中国。

台湾尼蝗 *Niitakacris taiwanensis* sp. nov. (Figs. 11–15)

正模: ♂, 台湾 南投 八通关 23°29'N, 120°59'E, 1990-VI-20–22, 楊正泽采。

词源: 新种名源自模式标本产地地名“Taiwan”。

模式标本存于自然博物馆, 台中, 台湾, 中国。

(责任编辑: 袁德成)