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Notes on the genus *Taiwanolagria* Masumoto, with a new species from China (Coleoptera: Tenebrionidae: Lagriinae)

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Abstract

The genus *Taiwanolagria* Masumoto is reviewed with two species, *Taiwanolagria reni* **sp. nov.** and *Taiwanolagria merkli* Masumoto, 1988. The new species from China can be diagnosed by the gently depressed male profemora, the expanded male metatibiae with basal tuft. Morphological comparisons of habitus, aedeagus, and diagnostic features of the two species are illustrated.

Key words: Lagriini, Taiwanolagria, new species, Oriental Region

Introduction

The genus *Taiwanolagria* Masumoto, 1988 was established with *Taiwanolagria merkli* Masumoto, 1988 as the monotypy (Masumoto 1988), and no more species were comprised until this paper. The type species was originally described from Taiwan, China (Masumoto 1988), then was listed from Fujian and Guizhou (Merkl 2004). It is characterized by modified male profemora and metatibiae: profemora sharply depressed in basal 2/5, metatibiae expanded in apical 3/5, with crenulate inner margin and distinct tuft at basal 1/5. Here, the second species, *Taiwanolagria reni* sp. nov., is described from Chongqing, Fujian, Guangdong, Guangxi, Yunnan, and Zhejiang. The characteristics distinguishing it from the type species are detailed.

Material and methods

Morphological observations and the aedeagus dissection were conducted under a stereomicroscope (Olympus SZ2-ILST). Habitus, diagnostic features, as well as measurements were taken using a digital stereomicroscope (KEYENCE-VHX-5000), then modified, annotated, and grouped to plates using Adobe Photoshop CS6. All Chinese common names are translated literally after the Latin names. Collecting data were cited verbatim with multiple lines of text separated by a slash "/".

Materials examined in this paper are deposited at the following institutions:

CNU—Chongqing Normal University, Chongqing, China;

MHBU—Museum of Hebei University, Baoding, China;

MYNU—Invertebrate Collection of Mianyang Normal University, Mianyang, China;

IZCAS—Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Taxonomy

Taiwanolagria Masumoto, 1988

Chinese common name: 台湾伪叶甲属

Taiwanolagria Masumoto, 1988: 41. Type species: Taiwanolagria merkli Masumoto, 1988, by original designation, by monotypy.

Distribution. Oriental Region.

Remarks. The genus is identified mainly by its modified male profemora and metatibiae (Masumoto 1988). However, some species of other genera in the subtribe Statirina Blanchard, 1845 also have modified male profemora and metatibiae (Zhou & Chen 2024). The monophyly of *Taiwanolagria* remains to be revealed.

Taiwanolagria merkli Masumoto, 1988

Chinese common name: 莫氏台湾伪叶甲 (Figs 1A-C, 2A-B, 3A, 3C, 3E-F, 3H, 3J, 3L)

Taiwanolagria merkli Masumoto 1988: 41 (Taiwan, description, illustrations of habitus, diagnosis characteristics and aedeagus (black and white)); Merkl 2004: 300 (short remarks, Fujian, Guizhou).

Material examined (12 ♂ 3 ♀). China: Taiwan: 1 ♂ (MHBU): "2008-V-1 / 台湾南投埔里镇 / 1400 m 林文信", Nantou County: Puli Town, Wen-Xin Lin leg.; 2 ♂ (MHBU): "2009-IV-16 / 台湾南投惠荪林场 / 780 m 周文一", Nantou County: Huisun Forest Farm, Wen-Yi Zhou leg.; 1 ♂ (MHBU): "2013-IV-19 / 台湾塔曼", Taman Mountain; 3 ♂ (MHBU): "Taiwan 新竹縣/ 五峰鄉 大鹿林道 / 15K, Alt = 1450 m / 2014-VI-15 / 陈常卿 leg.", Xinzhu County: Wufeng Town: Dalu Forest Road, Chang-Qing Chen leg.; 1 ♂ (MHBU): "Taiwan, Pingtung / Chunjih / Ta-han-shan, 大漢山 / 1300 m 2016.V.09 / Y.-T. Chung leg.", Pingdong County: Chunri Town: Dahanshan Mountain, Yi-Ting Zhong (钟奕霆) leg.; 2 ♂ (MHBU) (Figs 1A, 2A): "Taiwan, Nantou / Mei-feng, 梅峰 / 2100 m, 2016-VI-01 / Y.-T. Chung, B.-H. Kuo & C.-F. Lee leg.", Nantou County: Meifeng, Yi-Ting Zhong (钟奕霆), Po-Xin Guo (郭泊鑫) & Qi-Feng Li (李奇峰) leg.; 1 ♂ (CNU): "台湾花莲县卓溪县瑞穗林道 / 周文一14.IV.2018 860 m", Huanlian County: Zhuoxi Town: Ruisui Forest Road, Wen-Yi Zhou leg.; 1 ♀ (MHBU) (Figs 1B, 2B): "2005-IV-18 / 台湾南投关刀山 / 周文一", Nantou County: Guandaoshan Mountain, Wen-Yi Zhou leg.; 1 ♀ (MHBU) (Fig. 1C): "Taiwan, Pingtung / Chun-jih Ta-han-shan / 大漢山 / 1300 m 2016.IV.30 / S.-P. Wu & Y.-T. Chung leg.", Pingdong County: Chunri Town: Dahanshan Mountain, Shu-Ping Wu (吴书平) & Yi-Ting Zhong (钟奕霆) leg.; Guangxi: 1 ♂ (IZCAS): "广西那坡德孚 / 1440 m / 1998.IV.3 乔格侠", Napo County: Defu, Ge-Xia Qiao leg.; 1♀ (IZCAS): same to the previous, but 1998.IV.5, Chun-Sheng Wu (武春生) leg.

Diagnosis. Elytra unicolor, rarely with dark longitudinal band extending from base to apical 1/7 (Fig. 1C). Male (Figs 1A, 2A): antennae slender, length ratios of antennomeres I–XI as 68: 35: 68: 73: 77: 75: 76: 74: 69: 57: 160. Prothorax about 1.24× as long as wide, widest at base, distinctively wider than head at widest part. Profemora sharply depressed in basal 2/5 (Fig. 3H), with anterior margin emarginated at basal 1/5 (Fig. 3J, L); metatibiae expanded in apical 3/5, with crenulate inner margin and distinct tuft at basal 1/5. Aedeagus stout, clearly curved in lateral view (Fig. 3A, C); parameres wide with convolute lateral margins, sightly contracted in basal 1/3 (Fig. 3E); epinotal pieces of basal piece extending dorsad with dentate apex (Fig. 3F). Female (Figs 1B, 2B): similar to male, but length ratios of antennomeres I–XI as 72: 28: 63: 66: 69: 68: 72: 66: 66: 55: 147, antennomere XI shorter, ratio of interocular distance and diameter larger, prothorax about 1.12× as long as wide. Legs unmodified.

Measurement. Male: body length 11.5-14.9 mm, body width 3.1-3.6 mm (n = 12); female: body length 13.8-13.9 mm, body width 3.7 mm (n = 3).

Distribution. China: Taiwan, Fujian, Guizhou, Guangxi (new province record).

Remarks. The characteristics distinguishing this species from *T. reni* sp. nov. are presented in Table 1.

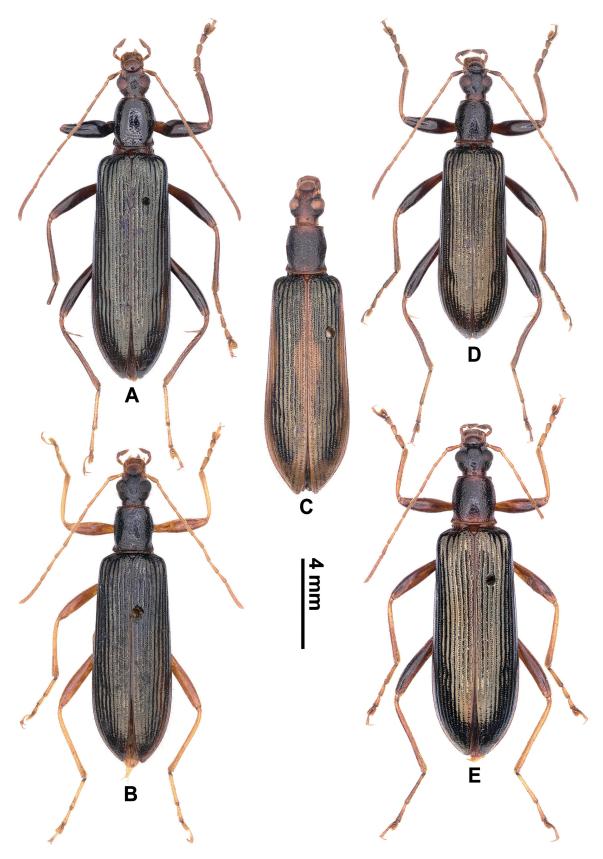


FIGURE 1. Habitus (dorsal view). **A–C.** *T. merkli*, **A.** Male (MHBU, Taiwan: Nantou County: Meifeng), the left protibial, protarsi and mesotarsi II–V missing, **B.** Female (MHBU, Taiwan: Nantou County: Guandaoshan Mountain), the right middle leg missing, **C.** Female (MHBU, Taiwan: Pingdong County: Chunri Town: Dahanshan Mountain), antennae and legs erased, to indicate the elytra color variation; **D–E.** *T. reni* **sp. nov.**, **D.** Holotype (male, CNU, Chongqing: Jiangjin District: Simianshan Natural Reserve: Dawopu Station), **E.** Female paratype (same to the holotype), antennomeres VIII–XI missing.

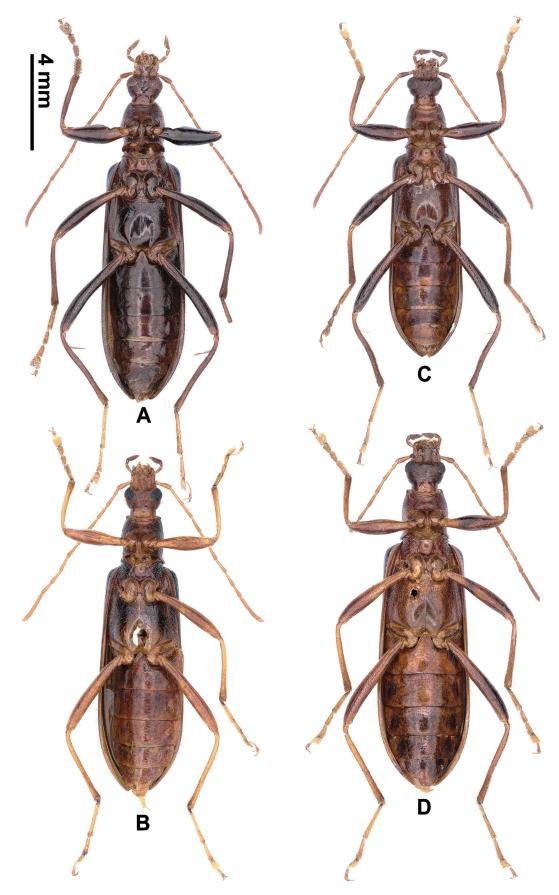


FIGURE 2. Habitus (ventral view). A-B. T. merkli, A. Male, B. Female; C-D. T. reni sp. nov., C. Holotype, D. Female paratype.

TABLE 1. Morphological comparisons between *T. merkli* and *T. reni* sp. nov.

		T. merkli	T. reni sp. nov.
ratio of prothorax length and width (male/female)		larger (male: ca. 1.24; female: ca. 1.12)	smaller (male: ca. 1.08; female: ca. 1.02)
legs (male)	profemora	sharply depressed in basal 2/5 (Fig. 3H), anterior margin emarginated at basal 1/5 (Fig. 3J, L)	gently depressed in basal 2/5 (Fig. 3I), anterior margin not emarginated (Fig. 3K, M)
	metatibiae	basal tuft longer and denser	basal tuft shorter
aedeagus	parameres (Fig. 3E)	sightly contracted in basal 1/3, wider before apex	parallel-sided in basal half, narrower before apex
	epinotal part of basal piece	with dentate apex (Fig. 3F)	with simple acute apex (Fig. 3G)

Taiwanolagria reni sp. nov.

Chinese common name: 任氏台湾伪叶甲 (Figs 1D-E, 2C-D, 3B, 3D, 3G, 3I, 3K, 3M)

Taiwanolagria merkli: Zhou & Chen 2014: 32 (nec Masumoto, 1988; misidentification).

Type material (15 $\stackrel{\wedge}{\circ}$ 19 $\stackrel{\bigcirc}{\circ}$). HOLOTYPE: CHINA: Chongqing: $\stackrel{\wedge}{\circ}$ (CNU) (Figs 1D, 2C): "20160501 / 重 庆江津四面山/保护区大窝铺 (灯)/邱见玥 许浩", Jiangjin District: Simianshan Natural Reserve: Dawopu Station, Jian-Yue Qiu & Hao Xu leg., light trap. PARATYPES: CHINA: Chongqing: 2 ♂ 1 ♀ (CNU): "2012-V-5 / 重庆市江津四面山 / 周勇", Jiangjin District: Simianshan Natural Reserve, Yong Zhou leg.; 1 ♂ (CNU): "20140502 / 重庆江津四面山 / 保护区 / 邱见玥 许浩", Jiangjin District: Simianshan Natural Reserve, Jian-Yue Qiu & Hao Xu leg.; 1 ♂ 1♀ (MYNU): "20160430 / 重庆江津四面山 / 保护区摩天岭 / 邱见玥 许浩", Jiangjin District: Simianshan Natural Reserve: Motianling, Jian-Yue Qiu & Hao Xu leg.; 1 & (CNU): same to the previous, but "20160516"; 2 ♂ (CNU): same to the holotype; 2 ♂ (CNU): "2016.V.2-13 / 重庆江津水口寺 / 许浩 邱见玥", Jiangjin District: Simianshan Natural Reserve: Shuikousi, Hao Xu & Jian-Yue Qiu leg.; 1 ♂ (CNU): "2016.VI.4 / 重庆江津四面山 / 天堂坝 / 许浩 邱见玥", Jiangjin District: Simianshan Natural Reserve: Tiantangba, Hao Xu & Jian-Yue Qiu leg.; 1♀ (CNU): "2013-V-27-VI-5/重庆市江津四面山/周勇", Jiangjin District: Simianshan Natural Reserve, Yong Zhou leg.; 1 ♀ (CNU): "2014.IV / 重庆江津四面山 / 邱见玥 许浩", Jiangjin District: Simianshan Natural Reserve, Jian-Yue Qiu & Hao Xu leg.; 1♀ (CNU): "2014.VI.2 / 重庆江津四面山 / 1000 m / 许浩", Jiangjin District: Simianshan Natural Reserve, Hao Xu leg.; 2♀(CNU): "2015.V.10/重庆江津四面山/大 洪海 / 许浩", Jiangjin District: Simianshan Natural Reserve: Dahonghai, Hao Xu leg.; 2 ♀ (CNU) (Figs 1E, 2D), same to the holotype; 3♀(CNU): "20160516/重庆江津四面山/保护区摩天岭/邱见玥 许浩", Jiangjin District: Simianshan Natural Reserve: Motianling, Jian-Yue Qiu & Hao Xu leg.; 1♀(CNU): "2023.4.30 / 重庆市江津四 面山 / 花果山隧道 / 周勇", Jiangjin District: Simianshan Natural Reserve: Huaguoshan Tunnel, Yong Zhou leg.; 2♀(CNU): "2023.5.1 / 重庆市江津四面山 / 插旗山(灯) / 周勇", Jiangjin District: Simianshan Natural Reserve: Chaqishan, Yong Zhou leg., light trap; Fujian: 1 ♂ (CNU): "武夷山 / 1986.5.6", Wuyi Mountain; Guangdong: 1 ♂ (CNU): "韶关乳源南岭国家森林公园 / E 113.042712° N 24.912290° / 2023.V.09 扫花 / 刘振华 王宇琪 韦理业", Shaoguan City: Ruyuan County: Nanling National Forest Park, Zhen-Hua Liu, Yu-Qi Wang & Li-Ye Wei leg., flower sweeping; Guangxi: 1 ♂ (IZCAS): "广西金秀银杉站 / 1100 m / 1999.V.10 李文柱", Jinxiu County: Yinshan Station, Wen-Zhu Li leg.; 1 ♂ 1 ♀ (CNU): "2023.V.29 / 广西花坪自然保护区 / 安江坪 / 邱鹭 振布", Huaping National Natural Reserve: Anjiangping, Lu Qiu leg., shaking;1♀(CNU): "2023.V.28 / 广西花坪 自然保护区 / 安江坪 扫花/ 邱见玥 1350 m", Huaping National Natural Reserve: Anjiangping, Jian-Yue Qiu leg., flower sweeping; **Yunnan:** 1♀ (CNU): "2016.V.16–18 / 云南屏边大围山 / 邱鹭", Pingbian County: Daweishan Mountain, Lu Qiu leg; 1♀(CNU): "20180525-27/云南屏边县大围山/大尖山 2100m/邱见玥 许浩", Pingbian County: Daweishan Mountain: Dajianshan, Jian-Yue Qiu & Hao Xu leg.; **Zhejiang:** 1 ♂ 1 ♀ (CNU): "2024.V.10 / 浙江天目山 1000-1200 m / 李建波", Tianmushan Mountain, Jian-Bo Li leg.

Description. Holotype ♂ (Figs 1D, 2C). Body length 12.5 mm, width 3.2 mm. Body elongate, about 3.91× as long as wide, slightly expanded backwards; black, except mandibles, labrum, frontal epistome brown, and anterior

margin, posterior margin, scutellum dark reddish, elytra shiny with green luster; antennae brown except antennomere I darker; legs black except basal femora, tibiae, tarsi brown; ventral surface dark brownish except membranes between ventrite 3–5 lighter. Dorsal surface with few long, yellow setae, mainly on the labrum, epistome, tempora and elytra apically; abdominal ventrites sparsely and abdominal apex densely covered with long setae. Tibiae and tarsi with moderately long setae, metatibiae with long setae on inner margin, and distinct tuft at basal 1/5.

Head elongate, almost glabrous, widest at eye level. Mouthparts strongly protruding forward; apical labial palpomere triangular; terminal maxillary palpus triangularly elongate with pointed apex, cavate inner surface, broadest at base; mandibles with sharp apex bending inward, embracing labrum; labrum transversely cordiform, slightly emarginate anteriorly; labro-epistomal membrane widely exposed; epistome elevated, higher than labrum, convex medially. Frons gently elevated, separated from epistome by arched forward fronto-epistomal "suture"; vertex flat with few punctures. Eyes slightly bulging, with anterior margin slightly invaded by frontal canthus, interocular distance about $0.74\times$ as long as eye diameter. Antennae slender, reaching metacoxae when directed backwards, antennomeres moderately elongate, length ratios of antennomeres I–XI as 60: 27: 61: 64: 65: 64: 65: 59: 52: 154, antennomere XI greatly lengthened, with pointed apex, slightly shorter than the combined length of three preceding antennomeres.

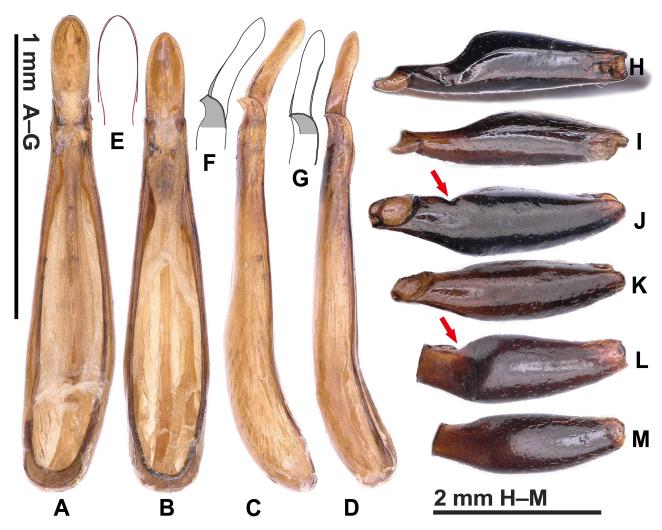


FIGURE 3. Diagnostic features. A–B. Aedeagus in ventral view, A. T. merkli, B. T. reni sp. nov.; C–D. Aedeagus in lateral view, C. T. merkli, D. T. reni sp. nov.; E. Comparisons of parameres contour, red and black indicating T. merkli, T. reni sp. nov. respectively; F–G. Apical aedeagus in lateral view, to indicate the shape differentiation of epinotal piece, F. T. merkli, G. T. reni sp. nov.; H–I. Anterior view of pro- femora and trochanter, H. T. merkli, I. T. reni sp. nov.; J–K. Ventral view of pro- femora and trochanter, J. T. merkli, red arrow indicating the emargination in anterior margin, K. T. reni sp. nov.; L–M. Dorsal view of profemora, L. T. merkli, M. T. reni sp. nov. (profemora base on the left)



FIGURE 4. Habitat of *T. reni* **sp. nov. A.** A living male wandering on leaves (2024.V.2, Zhejiang: Tianmushan Mountain, by Mr. Jian-Bo Li); **B.** The same male as the previous, hiding itself in leaves to avoid the cold weather; **C.** A female adult visiting flowers (photograph data as the previous, but 2024.V.1).

Prothorax about 1.08× as long as wide, widest at base, distinctively wider than head at widest part, constricted before base. Pronotum convex, slightly depressed at mid base, with a shallow groove in the middle line; moderately punctured, punctures sparser on disc; anterior angles obtuse, slightly elevated, posterior angles projecting laterally, and distinctively elevated; anterior margin slightly arched backwards in the mid 1/3, base straight with elevated carina, lateral parts roundly bending toward the ventral surface with the margins not visible in dorsal view. Prosternal process elevated as procoxae, with expanded mid and apex.

Scutellar shield glabrous, triangular, obtuse at apex. Elytra slender, convex, slightly expanded backwards, elytral length 2.73× as long as combined maximum width and 4.49× as long as prothorax; humeral callosity rounded in dorsal view, separated from disc by shallow impression; strial rows with coarse, not contiguous punctures, separated by distances 1 to 2× puncture diameter; intervals entirely flat, 3–5× wider than strial rows; odd-numbered intervals with few, fine setigerous punctures; elytral margin weak, visible in dorsal view except for the part of elytra under humeral callosity; elytral epipleura narrow, entire, gradually narrowing towards apex.

Legs slender; profemora swollen, gently depressed in basal 2/5 (Fig. 3I), anterior margin not emarginated (Fig. 3K, M); mesofemora moderately depressed in basal half, slightly curved in lateral view; metatibiae expanded in apical 3/5, with crenulate inner margin at apical 2/3, and long tuft at basal 1/5; metatarsomere I longest, length ratio of metatarsomere I and the combined length of II–IV as 8: 9.

Abdominal ventrites convex longitudinally, with a nearly round impression on each ventrite laterally. Membrane between ventrite 3–5 exposed.

Aedeagus stout, slightly curved in lateral view (Fig. 3B, D); parameres wide with blunt apex and convolute lateral margins, parallel-sided in basal half (Fig. 3E); epinotal pieces of basal piece extending dorsad with acute apex (Fig. 3G).

Female (Figs 1E, 2D). Body length 14.8 mm, width 3.9 mm. Similar to holotype, including body length, ratio of body length and width, length of antennae and length ratios of antennomeres, but length ratios of antennomeres I–XI as 63: 32: 64: 66: 65: 68: 72: 68: 68: 54: 156, antennomere XI shorter, interocular distance about 1.14× as long as eye diameter, prothorax about 1.02× as long as wide (looks wider), pronotum punctures denser. Legs unmodified.

Measurement. Male: body length 12.5-13.9 mm, body width 3.2-3.4 mm (n = 15); female: body length 11.6-14.8, body width 2.9-3.9 mm (n = 19).

Variability. Some beetles have dark brown dorsal surface, yellowish antennae and legs. Some lack shallow groove in the middle of the pronotum.

Ecology. The new species was mainly collected by flower sweeping and light trap at about 1000 m altitude, and was found visiting multiple flowers (Fig. 4C).

Distribution. China: Chongqing, Fujian, Guangdong, Guangxi, Yunnan, Zhejiang.

Etymology. The species epithet is dedicated to Prof. Guo-Dong Ren (任国栋), the famous Chinese entomologist in Tenebrionoidea, who guided the first author of this paper to start Lagriini taxonomic research, and provides sustained support on Lagriini specimens, including numbers of Taiwan materials examined in this paper.

Remarks. The new species is assigned to the genus *Taiwanolagria* for the moment for its high similarity to *T. merkli*. Two species can be distinguished by the characteristics listed in Table 1. Females of two species are difficult to identified externally, but can be separated by the ratio of prothorax length and width. Apical labial palpomere of *T. merkli* is somewhat broader than that of *T. reni* sp. nov.

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台湾伪叶甲属Taiwanolagria评述及一新种(鞘翅目: 拟步甲科: 伪叶甲亚科)

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摘要:记述台湾伪叶甲属Taiwanolagria两种,即任氏台湾伪叶甲T. reni **sp. nov.**和莫氏台湾伪叶甲T. merkli Masumoto, 1988。新种产自中国,可通过雄性缓慢压平的前足腿节和基部具长毛簇且扩宽的后足胫节识别。 文章对比图解了两个种的整体、阳茎和识别特征。

关键词: 伪叶甲族; 台湾伪叶甲属; 新种; 东洋区