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A REVIEW OF TAIWANESE PARAMISOLAMPIDIUS (COLEOPTERA, TENEBRIONIDAE: CNODALONINI)

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Paramisolampidius csorbai sp. n. is described from Hohuanshan, Central Taiwan. *Paramisolampidius alishanus* MASUMOTO, 1981 and *Paramisolampidius wufengus* MASUMOTO, 1981 are junior synonyms of *Paramisolampidius shirozui* (M. T. CHÛJÔ, 1967). *Paramisolampidius kagoshimensis* NAKANE, 1968 is designated as the type species of the *Paramisolampidius* NAKANE, 1968, which is an unavailable genus-group name, because it was published after 1930 without fixed type species. A key to the five Taiwanese species of the genus is given.

Key words: Tenebrionidae, Cnodalonini, *Paramisolampidius*, Taiwan, key, new species, type species designation

INTRODUCTION

The genus *Paramisolampidius* was described by NAKANE (1968: 82) for two Japanese (*Misolampidius tokarensis* NAKANE, 1963 and *Paramisolampidius kagoshimensis* NAKANE, 1968) and one Taiwanese species (*Misolampidius shirozui* M. T. CHÛJÔ, 1967) of the traditional tribe Misolampini, which is now regarded as a polyphyletic assemblage of apterous genera of Cnodalonini (= Coelometopini) (DOYEN *et al*. 1989). As the genus name was published after 1930, and no type species was clearly designated in the original paper, it is unavailable (ICZN 1999, Art. 13.3). We designate here *Paramisolampidius kagoshimensis* NAKANE, 1968 as the type species of the genus, so the name becomes available as *Paramisolampidius* MERKL et MASUMOTO, 2007. We left the name itself unchanged, because several further species of the genus were described subsequently.

MASUMOTO (1981*a*, *b*, 1984) described five species from Taiwan. The present paper is devoted to the description of another new species, a revision of the described Taiwanese taxa and a key to identification of the Taiwanese species.

The species of *Paramisolampidius* are 11–16 mm long, almost entirely black beetles. Males can be differentiated from females by slenderer body, longer legs and presence of a small subapical tooth on the inner side of protibia. Adults are

nocturnal, found on dead or dying trees in mature mountain forests. Immature stages are unknown.

All species of *Paramisolampidius* are flightless. This fact, combined with the rugged topography of Taiwan, may result in isolated populations (Fig. 1), which differ in body proportions and sculpture. Further allopatric species of *Paramisolampidius*, each restricted to a much more limited area, may be expected to find in Taiwan by future investigations.

Specimens on which the present paper is based are housed in the following collections: CKM = collection of KIMIO MASUMOTO (Tokyo, Japan); CKA = collection of KIYOSHI ANDO (Osaka, Japan); CKAK = collection of KATSUMI AKITA (Hisai, Japan); ELKU = Entomological Laboratory, Kyushu University (Fukuoka, Japan; curator: SATOSHI KAMITANI); HNHM = Hungarian Natural History Museum (Budapest, Hungary; curator: OTTÓ MERKL); NSMT = National Science Museum (Natural History) (Tokyo, Japan; curator: SHUHEI NOMURA); TARI = Taiwan Agricultural Research Institute (Wufeng, Taiwan, Republic of China; curator: HSIEN-TZUNG SHIH); TFRI = Taiwan Forestry Research Institute (Taipei, Taiwan, Republic of China; curator: JUNG-TAI CHAO).

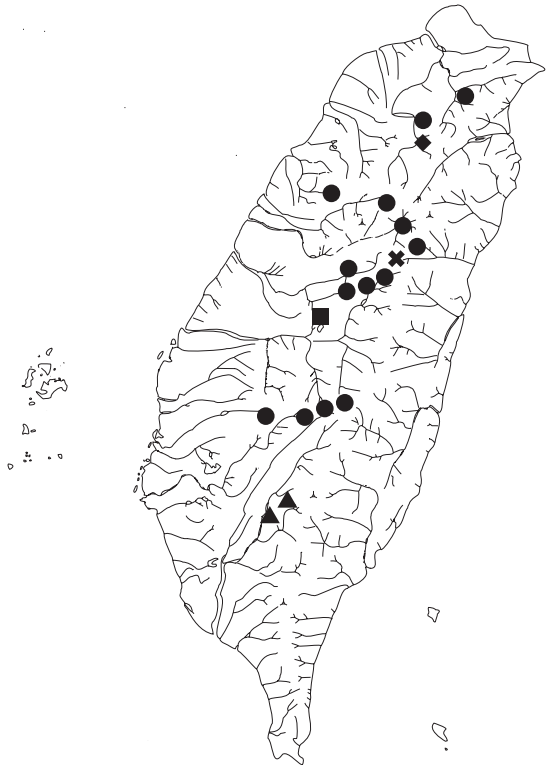


Fig. 1. Localities of *Paramisolampidius* in Taiwan: × = *P. csorbai* sp. n., circle: *P. shirozui* (M. T. CHÛJÔ, 1967), triangle; *P. tenghsiensis* MASUMOTO, 1984, square: *P. formosanus* MASUMOTO, 1981, diamond: *P. kinugasai* MASUMOTO, 1984

Paramisolampidius csorbai sp. n.
(Figs 2, 7, 12)

Type material – Holotype, male, "Taiwan, Nantou Pr., / Hohuanshan Exp. Stat., / 24.09' N, 121.17' E", "from bark at night / 3100 m, 27. IX. 1999 / G. CSORBA & B. HERCZIG". It is deposited in the HNHM.

Description – General: body elongate, constricted between fore and hind bodies gently convex, glabrous; colour piceous, apical half of antennae paler in colour, meso- and metasterna, tibiae and claws dark brown, hairs on ventral surface of tibiae pale golden; dorsal surface moderately shining, slightly sericeous (Fig. 2). Body length 13 mm.

Head: gently convex in posterior part, gradually inclined anteriorly, surface with microscopic isodiametrical reticulation and small punctures; basal membrane of labrum exposed. Clypeus transversely elliptical, anterior edge straight. Fronto-clypeal suture complete, rounded and sulcate. Genae weakly swollen, subparallel-sided before eyes, then rounded and meeting edge of clypeus at an angle of about 170°. Eyes obliquely ovate, rounded inwardly, medium-sized for a *Paramisolampidius*, separated by distance equal to 3 eye widths. Inner margins of eyes sulcate from behind to middle of the eye (Fig. 7), width of ocular sulcus about 1/4 times the width of transverse diameter of an eye. Antennae slightly clavate, reaching base of pronotum, terminal segment tear-shaped, segment length ratios from base to apex as follows: 2.7, 1.0 (shortest segment), 2.6, 1.9, 1.6, 1.6, 1.5, 1.5, 1.4, 1.3, 2.6. Mentum with strong anteromedian convexity, with elevated longitudinal keel.

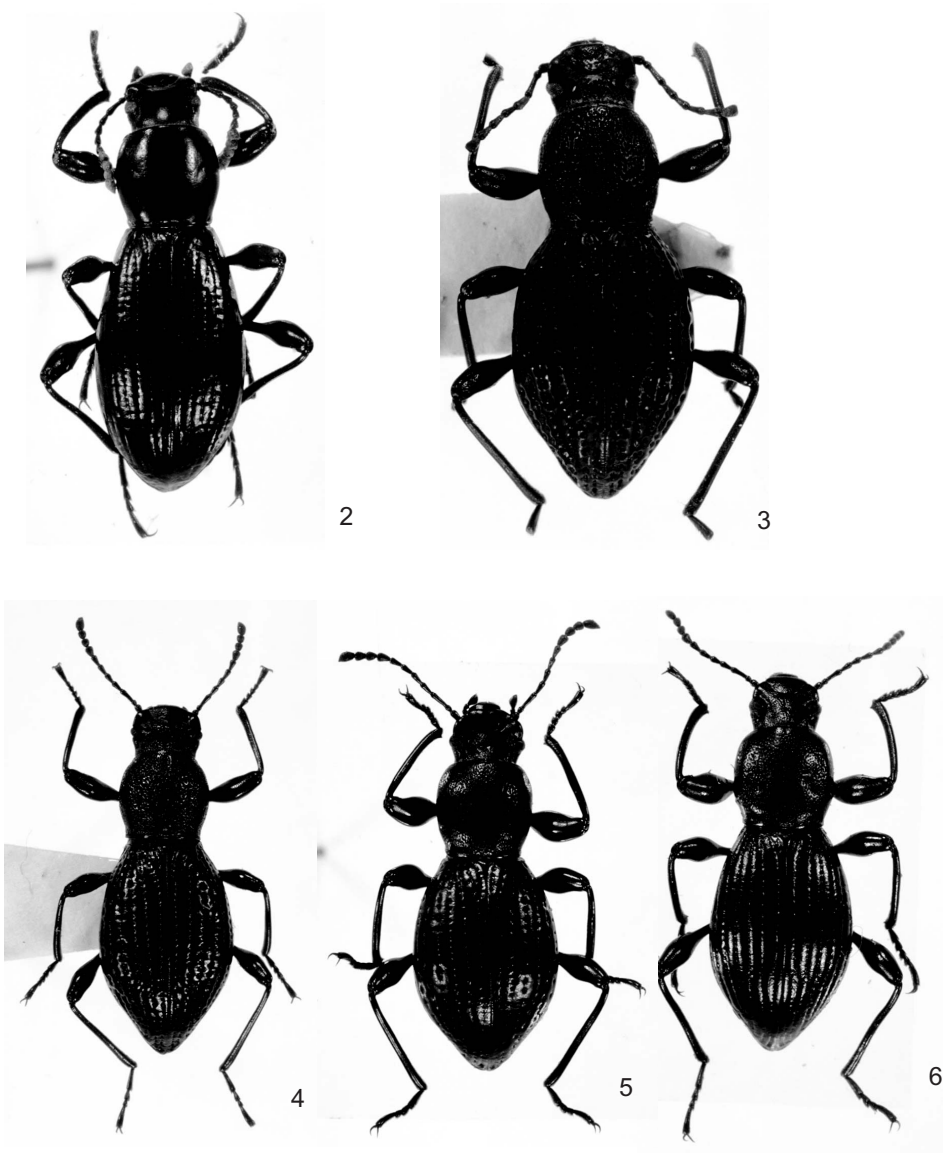
Prothorax: barrel-shaped, barely longer than wide, widest immediately before middle; apex a little wider than base; sides gently and evenly rounded; anterior edge finely margined except along major part of middle; base nearly straight, feebly sinuous in lateral parts, strongly margined in major part of middle; pronotal carina absent; anterior angles rounded, not prominent, posterior angles truncate; pronotal disc gently convex, surface with microscopic isodiametrical reticulation and widely scattered very small punctures and with a shallow mid-longitudinal impression; the coarsest punctures are along midline. Hypomeron with a few scattered punctures. Prosternum with very few small punctures and obsolete wrinkles; prosternal process shallowly bifurcate.

Pterothorax: scutellum equilaterally triangular, weakly raised in middle, microscopically sculptured, irregularly punctate laterally. Elytra oblong elliptical, gently convex, highest at the middle, 1.8 times as long as wide, 2.86 times the length and 1.49 times the width of pronotum, widest at the middle; surface with microscopic isodiametrical reticulation, punctato-striate, striae shallow with punctures small, widely and rather irregularly set; intervals feebly convex, with scattered very small punctures and sparse, transverse wrinkles; humeri reduced; apices rounded; epipleuron narrow, ending just before apex, epipleural carina weak, not visible from above. Mesoventrite sparsely punctate. Mesepisternum, mesepimeron and metepisternum impunctate. Metaventrite impunctate, with Y-shaped discrimen.

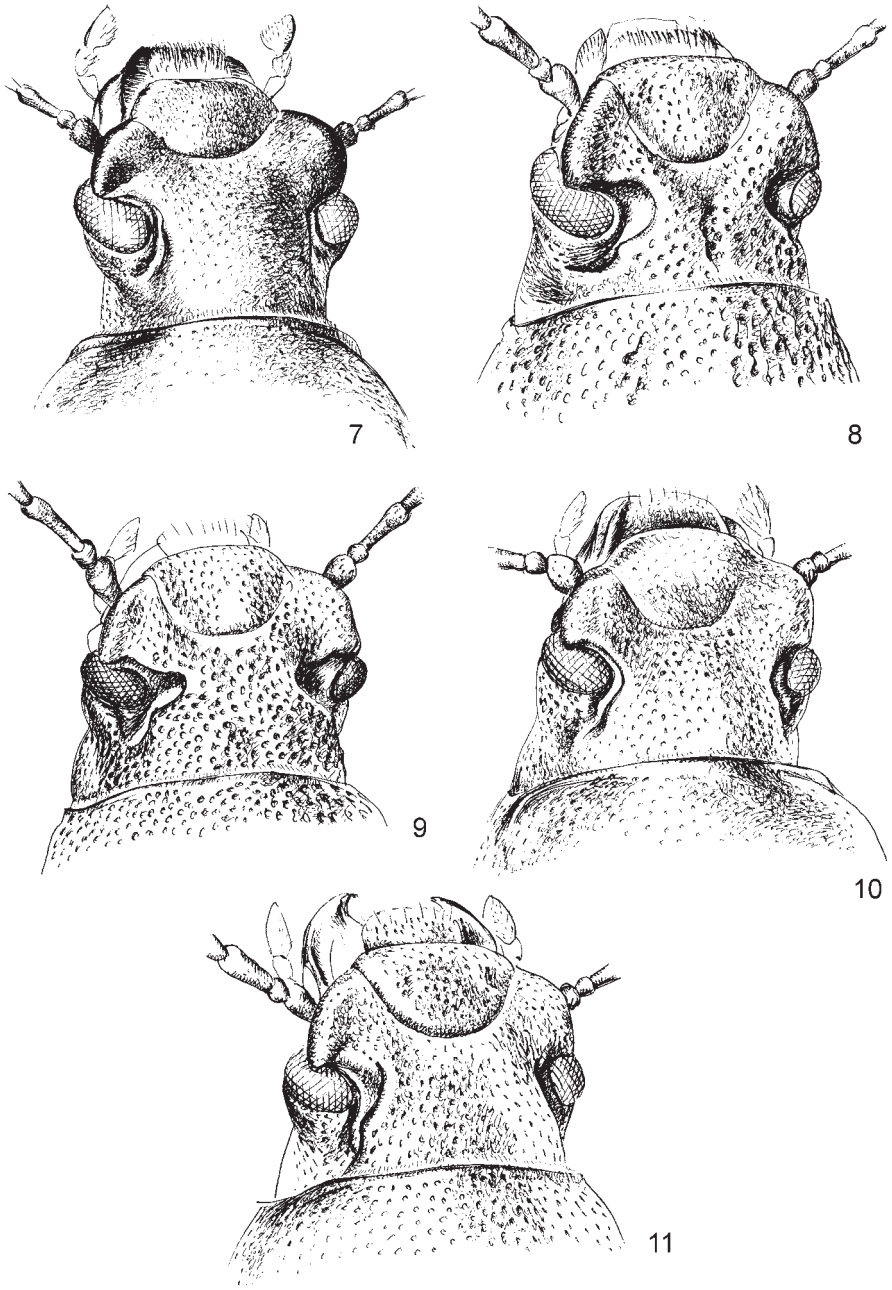
Legs: long, femora strongly clavate, thickened in middle, with basal parts thin, finely and sparsely punctate; protrochanter angulate distally; protibia gently curved; pro- and mesotibia with a small denticle just before apex of ventral surface; metatibia weakly bent backwards; length ratios of protarsomeres: 1.9, 1.3, 1.0 (shortest segment), 1.2, 3.6; mesotarsomeres: 2.2, 1.5, 1.3, 1.2, 3.8; metatarsomeres: 3.9, 1.7, 1.5, 4.3.

Abdomen: intercoxal process of first ventrite twice as wide as long; ventrites sparsely and finely punctate; last ventrite rounded at apex. Aedeagus subfusiform, 2.05 mm in length, 0.45 mm in width, gently curved in lateral view; the very apex broken in the holotype (Fig. 12).

Diagnosis – This new species can be easily distinguished from other species described from Taiwan by its elongate and slender body with very finely punctate



Figs 2–6. Habitus of *Paramisolampidius* species: 2 = *P. csorbai* sp. n., 3 = *P. formosanus* MASUMOTO, 1981, 4 = *P. kinugasai* MASUMOTO, 1984, 5 = *P. shirozui* (M. T. CHÛJÔ, 1967), 6 = P. *tenghsiensis* MASUMOTO, 1984



Figs 7–11. Head of *Paramisolampidius* species: 7 = *P. csorbai* sp. n., 8 = *P. formosanus* MASUMOTO, 1981, 9 = *P. kinugasai* MASUMOTO, 1984, 10 = *P. shirozui* (M. T. CHÛJÔ, 1967), 11 = *P. tenghsiensis* MASUMOTO, 1984

dorsal surface and incomplete ocular sulcus. See also the subsequent key to the Taiwanese species of the genus *Paramisolampidius*.

Distribution – Only the holotype is known, which is from Hohuanshan in Nantou county. The locality falls into the area of *P. shirozui*. Although one specimen does not allow drawing conclusions about the niche segregation of these two species, it is probable that *P. csorbai* and *P. shirozui* are separated by the altitude, with *P. csorbai* in *Tsuga-Picea* and *Abies* (upper montane and subalpine) zones and *P. shirozui* in *Machilus-Castanopsis* and *Quercus* (submontane and montane) zones, including the montane mixed coniferous forests.

Biology – The specimen was collected from the bark of dead trees at night using a torch – a simple but highly effective method of collecting nocturnal saproxylic and mycetophagous tenebrionid beetles.

Etymology – This new species is dedicated to Dr. GÁBOR CSORBA (Curator of Mammals, Hungarian Natural History Museum, Budapest), one of the collectors of the holotype. In spite of his different profession, he is an enthusiastic and productive insect collector who brought back valuable materials from his numerous trips to Southeast Asia.

Paramisolampidius formosanus MASUMOTO, 1981
(Figs 3, 8, 13)

Paramisolampidius formosanus MASUMOTO, 1981*a*: 32.

Specimen examined – Holotype, male (NSMT): Taiwan, Nantou Hsien, Tehuashe, Rijuetan [= Sun Moon Lake, with Chinese characters], 11.X.1976, J. ITO leg. Habitus: Fig. 3; head: Fig. 8; aedeagus: Fig. 13.

Paramisolampidius kinugasai MASUMOTO, 1984
(Figs 4, 9)

Paramisolampidius kinugasai MASUMOTO, 1984: 17.

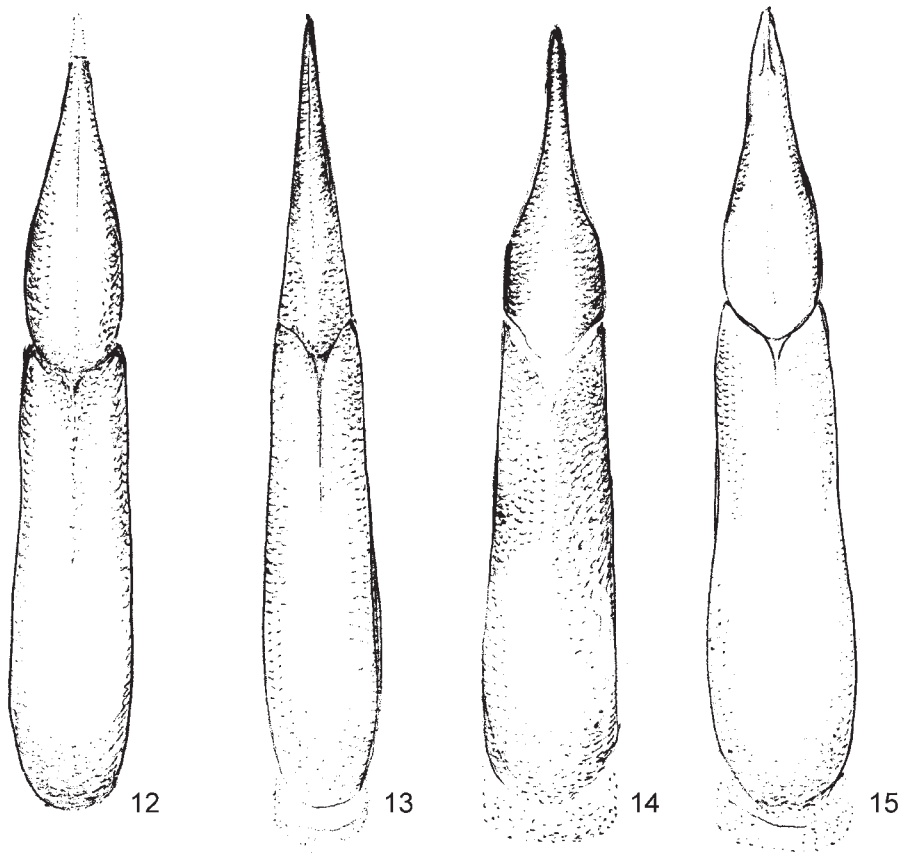
Specimen examined – Holotype, female (NSMT): Taoyuan Hsien, Suling [with Chinese characters], 3.V.1981, K. KINUGASA leg. Habitus: Fig. 4; head: Fig. 9.

Paramisolampidius shirozui (M. T. CHÛJÔ, 1967)
(Figs 5, 10, 14)

Misolampidius shirozui M. T. CHÛJÔ, 1967: 379.

Paramisolampidius shirozui: NAKANE 1968: 82.
Paramisolampidius alishanus MASUMOTO, 1981*b*: 79, **syn. n.**
Paramisolampidius wufengus MASUMOTO, 1981*b*: 80, **syn. n.**

Specimens examined – Chiayi Hsien: Alishan, 25.VI.1981, K. MASUMOTO (holotype of *P. alishanus*, NSMT, 1 paratype of *P. alishanus*, CKM); Alishan, Shihou, 9.IV.1986, M. OHARA (6, CKM); Alishan, Shihou, 10.IV.1986, M. OHARA (1, CKM); Mt. Alishan, 5–6.VII.1965, KUROSAWA, Japan-U.S. Co-operative Sci. Program (1, NSMT); Mt. Alishan, 2200 m, 24.III.1982, T. SHIMOMURA (1, CKM); Arisan, Y. MIWA (2, TARI); Fenchihu, 26.VI.1981, K. MASUMOTO (holotype of *P. wufengus*, NSMT, 2 paratypes of *P. wufengus*, CKM); Fenchihu, 24.VI.1982, K. MASUMOTO (3, CKM); Funchifo [= Fenchihu], 26.III.1970, T. KOBAYASHI (1, CKA); Funchifo [= Fenchihu], 28.IV.1971, T. HAYASHI (1, CKA); Funchifo [= Fenchihu], 25.IV.1973, Y. KIYOYAMA (1, CKA). – *Hualien Hsien*: Pilu, 20.III.1926, T. KANO (1, NSMT); Pilu, 16.V.1928, T. KANO (1, NSMT). – *Miaoli Hsien*:



Figs 12–15. Aedeagus of *Paramisolampidius* species, dorsal view: 12 = *P. csorbai* sp. n., 13 = *P. formosanus* MASUMOTO, 1981, 14 = *P. shirozui* (M. T. CHÛJÔ, 1967), 15 = *P. tenghsiensis* MASUMOTO, 1984

Peikan-Shantaowench'uan, 11.IV.1967, T. SHIROZU (holotype of *P. shirozui*, ELKU). – *Nantou Hsien*: Hewanshan, 20.III.1985, LU CHINCHIH (3, CKM); Hewanshan, 6.V.1985, LU CHINCHIH (2, CKM); Hewanshan, 27.V.1991, C. C. LOH (1, CKM); KAO-LENG DYI, 18 km W of Wushe, 24°4.605'N, 121°7.583' E, 2074 m, from tree trunks at night, 18–19.IV.2002, leg. D. ANSTINE, GY. FÁBIÁN & O. MERKL (21, HNHM); Meifeng, 9.VI.1973, H. YOKOYAMA (3, CKM); Meifeng, 11.VI.1973, H. YOKOYAMA (1, CKM); Meifeng, 22.V.1974, K. AKIYAMA (1, CKM); Meifeng, 24.V.1974, H. YOKOYAMA (1, CKM); Meifeng, 25.V.1974, H. YOKOYAMA (1, CKM); Meifeng, 14.VI.1974, H. YOKOYAMA (4, CKM); Meifeng, 14.VI.1974, K. AKIYAMA (1, CKM); Meifeng, 2.I.1975, K. MASUMOTO (4, CKM); Meifeng, 10.VIII.1975, K. MASUMOTO (2, CKM); Mt. Kuantoushan, 17.IV.1993, LU CHINCHI (2, CKM); Musha [= Wushe], V.18.-VI.15.1919, T. OKUNI (1, TARI); Nanshanchi, 800 m, 30.VI.1965, Y. KUROSAWA, Japan-U.S. Co-operative Sci. Program (1, NSMT); Nanshanchi, 800 m, 30.VI.1965, R. ISHIKAWA (1, NSMT); Nanshanshi, 2.X.1991, C. C. LOH (2, CKM); Sungkang, 11.VI.1974, H. YOKOYAMA (1, CKM); Sungkang-Tsuifeng, 2040–2300 m, 5.VIII.1984, KATSUMI AKITA (1, CKAK); Songgang, 19.VII.1991, C. C. LOH (4, CKM); Rinnei Nature Conservation Area, between Meifeng and Tsuifeng, 2100 m, from tree trunks at night, 16.XI.2002, L. RONKAY & O. MERKL (3, HNHM); Tatachia, 25.X.1997, Y. S. CHONG (1, TFRI); Tzuchung, 23°29'19" N, 120°51'13" E, 2375 m, from tree trunks at night, 23.XI.2002, L. RONKAY & O. MERKL (3, HNHM); no closer locality, VII.1963, unknown collector (1, HNHM). – *Taichung Hsien*: Dashueshan, 04.V.1990, SUZUKI (1, CKM); Dashueshan, 12.VI.1991, C. C. LOH (2, CKM); Lishan, 17.VI.1973, H. YOKOYAMA (1, CKM); Lishan, 15.VIII.1974, Y. KIYOYAMA (1, CKA); Lishan Forest, 30.IV.1975, W. OUCHI (1, CKM); Xiaoxueshan, 21.X.1961, Y. Z. ZHANG (1, TFRI). – *Taipei Hsien*: Wulai, 25.V.1971, K. SAKAI (1, CKM). – *Taoyuan Hsien*: Lalashan, 16.VI.1983, K. MASUMOTO (2, CKM). – *No closer locality*: Formosa, 1969–1971 (4, CKA); Formosa, 1969 (2, CKA); Formosa (1, CKA); Taiwan (8, CKM). – Unknown locality: Keinanzan, 18.V.1935, Y. MIWA (1, TARI). Habitus: Fig. 5; head: Fig. 10; aedeagus: Fig. 14.

Remarks – The holotype of *P. shirozui* was described from the locality in Miaoli county as written in the Specimens examined. However, the specimen bears the locality label written in Japanese (with Latin letters) as follows: "(TAIWAN) / Hokuko- / Kaminoshima-onsen / Byoritsu-ken / 11.iv.1967 / T. SHIROZU".

P. alishanus was described from Alishan on the basis of three specimens. MASUMOTO (1981*a*) distinguished it from *P. shirozui* by "larger, more elongated body, distinct comma-shaped impressions on the pronotum, clearly convex transversely wrinkled, reticulate and microscopically setaceous elytral intervals, and elongate aedeagus". *P. wufengus* was described in the same paper on the basis of three specimens from Fenchihu (15 km west of Alishan in the same mountain range), and was separated from *P. shirozui* by the elytra much more finely punctate-striate and with smooth or feebly reticulate intervals.

The senior author collected 21 specimens in a rather small area of forest in Kao-Leng Dyi, which belong to the same species. They exhibit considerable variability in pronotal punctures (sparser or denser), impressions of pronotum (deep, shallow or absent), depth of elytral striae (shallow or deeper), wrinkles of elytral intervals (present or absent), but these are a matter of degree, and the characters occur in all combination. The same is true for the materials from Alishan, Meifeng,

Fenchihu etc. This kind of variability is not unusual in various groups of flightless Tenebrionidae, and supports that both *P. alishanus* and *P. wufengus* should be synonyms of *P. shirozui.*

This species is apparently not uncommon in the mountains of Chiayi and Nantou counties of Central Taiwan, and some specimens come from the adjacent counties as well. The northernmost locality is Wulai in Taipei county, about 30 km south of Taipei, while the mountains around Alishan and Fenchihu constitute the southernmost part of the area known to date. Altitudinal separation from *P. csorbai* see under that species.

Paramisolampidius tenghsiensis MASUMOTO, 1984
(Figs 6, 11, 15)

Paramisolampidius tenghsiensis MASUMOTO, 1984: 19.

Specimens examined – Kaohsiung Hsien: Fengkangshan, 10.VI.1984, K. MASUMOTO (6, CKM); Tenghsi, 13.VI.1983, K. MASUMOTO (holotype, NSMT, 5 paratypes, CKM); Tenghsi, 14.VI.1983, K. MASUMOTO (6 paratypes, CKM); Tenghsi, 7.VIII.1983, CHEN WENLUNG (1 paratype, CKM); Tenghsi, 21.VI.1984, CHEN WENLONG (1, CKM); Tenghsi, 11.VII.1985, CHEN WENLONG (1, CKM); near Liukuei, Chihnanshan, 7.VIII.1986, CHEN WENLONG (1, CKM); near Liukuei, 11.XI.1985, WENLUNG CHEN (2, CKAK); Liukuei, Nanfengshan, 9.VIII.1984, KATSUMI AKITA (5, CKAK); Liukiei, Taiyuanshan, 7.V.1985, CHEN WENLONG (1, CKM); Liukuei, Taiyuanshan, 19.V.1985, CHEN WENLONG (1, CKM). Habitus: Fig. 6; head: Fig. 11; aedeagus: Fig. 15.

Remarks – The species is distributed in the southern part of the Central Mountains in Kaohsiung county, apparently not overlapping the range of *P. shirozui*.

KEY TO THE SPECIES OF *PARAMISOLAMPIDIUS* FROM TAIWAN

1(4) Ocular sulcus rather complex, deeply sinuate inwardly (Figs 8–9); eyes more oblique and narrowly spindle-shaped; pronotum with punctation subcontiguous; elytra with rows of separated punctures, not striate.

2(3) Whole dorsal surface opaque; head and pronotum less closely punctate; elytra with rows of widely spaced foveolate punctures (Fig. 3); length 11 mm; Tehuashe (600 m a. s. l.), Riyuetan, Nantou Hsien, C Taiwan
P. formosanus MASUMOTO, 1981*a*

3(2) Head and pronotum opaque, scutellum and elytra shining, alutaceous; head and pronotum closely and coarsely punctate; elytra with rows of narrowly separated punctures (Fig. 4); length 12.5 mm; Suleng (1,100 m a. s. l.), Taoyuan Hsien, N Taiwan *P. kinugasai* MASUMOTO, 1984

4(1) Ocular sulcus simple, not deeply sinuate (Figs 7, 10) or slightly bulged (in *P. tenghsiensis*, Fig. 11); eyes more transverse and rounded; pronotal punctation either very fine or coarse but punctures clearly separated; elytra striate-punctate, at least in first two rows.

5(6) Ocular sulcus narrow and incomplete, running from behind to middle of inner margin of eye (Fig. 7); body slender; pronotum remarkably sparsely and finely punctate; length 13 mm; Hohuanshan (3,100 m a. s. l.), Nantou Hsien, C Taiwan **P. csorbai** sp. n.

6(5) Ocular sulcus broader and complete (running around whole eye); body more robust; pronotum coarsely punctate.

7(8) Ocular sulcus simple (Fig. 10); punctures on pronotum mostly rounded; posterior half of prothoracic epipleuron with contiguous punctures forming wrinkles; elytra with strial punctures finer, not wider than width of striae; length 13–16 mm; various localities of C and N Taiwan
P. shirozui (M. T. CHÛJÔ, 1967)

8(7) Ocular sulcus slightly bulged inwardly (Fig. 11); punctures on pronotum longitudinally ovate; posterior half of prothoracic epipleuron with separate punctures; elytra with strial punctures coarse, distinctly wider than width of striae; length 12.5–15.5 mm; Tenghsi and Liukuei (about 1,400 m a. s. l.), Kaohsiung Hsien, S Taiwan *P. tenghsiensis* MASUMOTO, 1984

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