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Occurrence of a Fourth *Dicranocephalus* Species in Formosa, with Description of a New Subspecies of *Dicranocephalus yui* Y. KUROSAWA (Coleoptera, Scarabaeidae)

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Abstract A new cetoniid, *Dicranocephalus shimomurai* nov., which is the fourth species of the genus from Formosa, and a new subspecies, *D. yui cheni* nov. from southern Formosa are described. It is a striking fact that there occur four different species of *Dicranocephalus* in such a small oriental island as Formosa. The number equals to that occurring in the Chinese Continent.

In 1968, I described two new species and a new subspecies of the genus *Dicranocephalus* from Formosa in addition to the well known species from that island. At that time, no specialist could expect that a fourth species would be found in Formosa. In 1981, however, a strange species of the genus different from any of three theretofore known was brought forth by Mr. Tohru SHIMOMURA of Tokyo, who caught two males of this species flying high on the top of trees in northern Formosa. Later, several specimens including a female of the same species brought to my hand for study through the kindness of Messrs. Kaoru SAKAI of Tokyo and Hanmei HIRASAWA of Matsumoto, Nagano Prefecture.

This new species doubtlessly belongs to the *adamsi* group of the genus *Dicranocephalus* HOPE, 1831, represented by *D. adamsi* PASCOE, 1863, from Korea and China, by the colour pattern and the shape of body in both sexes especially by those of the female. It must be the Formosan representative of this group. *D. yui* Y. KUROSAWA, 1968, described from central Formosa, must be situated at the beginning of this group. It is striking that there occur four species of the genus in such a small oriental island as Formosa as in the mainland of China.

Before going further, I wish to express my hearty thanks to the three entomologists mentioned above, and also to Mr. Shinji NAGAI of Tokyo for his kind offer of material.

Dicranocephalus shimomurai sp. nov.

Male. Head with antlers and antennae dark purpureous brown, with a small patch of greyish but distinct velvety bloom at the posterior side of each eye, and a smaller inconspicuous patch of the same colour on each side of frons; pronotum covered by dark velvety grey bloom, with the exception of two broad naked median

striae which are convergent anteriorly, neither carinate nor edged, and extend from anterior margin to near posterior third; scutellum covered with velvety grey bloom, with the sides naked and margined with purpureous brown; elytra covered with velvety purpureous grey bloom, with the humeral and ante-apical patches naked dark purpureous brown; body beneath clothed with velvety grey brown, with the naked parts of legs and sterna reddish brown or dark purpureous brown.

Head slightly excavated between two oblique ridges which run from just the interior side of antennal cavities towards the centre of the anterior margin of pronotum and form posteriorly convergent ridges, but the excavation is slightly elevated at the middle; oculo-frontal ridge of each eye narrow and long, prolonged and occupying almost anterior half of eye; clypeus broad and slightly bisinuate; antlers narrow and well separated from each other, abruptly and sharply arised apically, with a small erected branch at the outer part just before the middle of each antler; antennae compact, with the first segment long and fusiform, shorter than the six following segments united and about as long as the width of the anterior lamellate segments.

Pronotum subpentagonal, about 1.2 times as wide as long, and widest at the middle; sides swollen and produced laterally, though rounded at the middle, and somewhat sinuate just behind the anterior angles, which are obtusely angulate in dorsal aspect, the ridge between propleuron and prosternum being more sharply produced beyond and under each anterior angle; posterior margin rounded and produced posteriorly, without posterior angle; anterior margin slightly bisinuate with the median lobe narrowly and slightly produced; marginal carinae entirely elevated, and slightly sinuate in lateral aspect; disc slightly convex, with the median anteriorly convergent bare carinae distinct, broad, extending posteriorly beyond the middle; the carinae individually variable in length, sometimes extending to near basal margin. Scutellum triangular, flattened, with the patch of velvety bloom individually variable in size and form, sometimes almost absent.

Elytra slightly longer than wide, widest just behind humeri; sides obliquely expanded laterally at humeri, subparallel to near apical third, then gradually rounded and narrowed posteriorly, with the apices somewhat produced at the sutural angles; lateral margin naked, entirely but narrowly reflexed; disc flattened, with bare subtriangular patch at each shoulder and an oblique but narrowly elongate patch at the latero-interior part of apex on each elytron; sutural and lateral margins narrowly but entirely reflexed.

Mesosternal process acute and triangularly produced anteriorly, and slightly abased apically. Metasternum longitudinally impressed at the middle, but the impression ends posteriorly in a rhombic hollow. Pygidium broad, semicircularly rounded at the apex.

Legs long; anterior pair distinctly longer than the others, slender, with the interior side of each tibia almost straight and tarsi much longer than tibiae; meso- and metatarsi always longer than meso- and metatibiae.

Male genital apparatus somewhat similar to that of *D. yui*, but robuster, with

paramere more broadly emarginate laterally at the base and broadened as in *D. bourgoini*.

Variations. In smaller individuals, the antlers become shorter, curve interiorly at the apices, and are approximate those of *D. yui* Y. KUROSAWA, 1968, from central Formosa.

Length: 19.2–23.2 mm (without antlers), 22.4–29.2 mm (with antlers); width: 9.8–11.7 mm.

Female. Entirely blackish, mat, without any marking of velvety bloom. Head without antler, coarsely and irregularly punctate, depressed, with the anterior margin reflexed, tuberculate and pointed on each side. Pronotum rounded on the sides, not angulate; disc rather uniform, neither ridged nor carinate; surface very sparsely, irregularly and finely punctured. Elytra mat and impunctate. Legs short and robust, with protarsi about as long as protibiae, and meso- and metatarsi slightly but distinctly shorter than their tibiae. Pygidium broadly rounded.

Length: 24.2 mm; width: 12.0 mm.

Holotype and paratopotype: 2 ♂♂, Ssuling, 900 m, Taoyuan Hsien, N Formosa, 30. iv. 1981, T. SHIMOMURA lgt.; allotype: ♀, Baron, Taoyuan Hsien, N Formosa, 2–4. v. 1984, M. KIMURA lgt.; paratypes: 3 ♂♂, Palin, 900 m, Taoyuan Hsien, N Formosa, 1. v. 1985, K. SAKAI lgt.; 1 ♂, Hsileng, Taoyuan Hsien, N Formosa, 17. v. 1984, K. IKEDA lgt.

Range: Formosa.

The holotype, the paratopotype and a paratype collected by Mr. K. SAKAI are preserved in the collection of the National Science Museum, Tokyo. The allotype and a paratype collected by Mr. K. IKEDA are returned to the collection of Mr. H. HIRASAWA and the two paratypes collected by Mr. K. SAKAI are also returned to the collection of Mr. K. SAKAI.

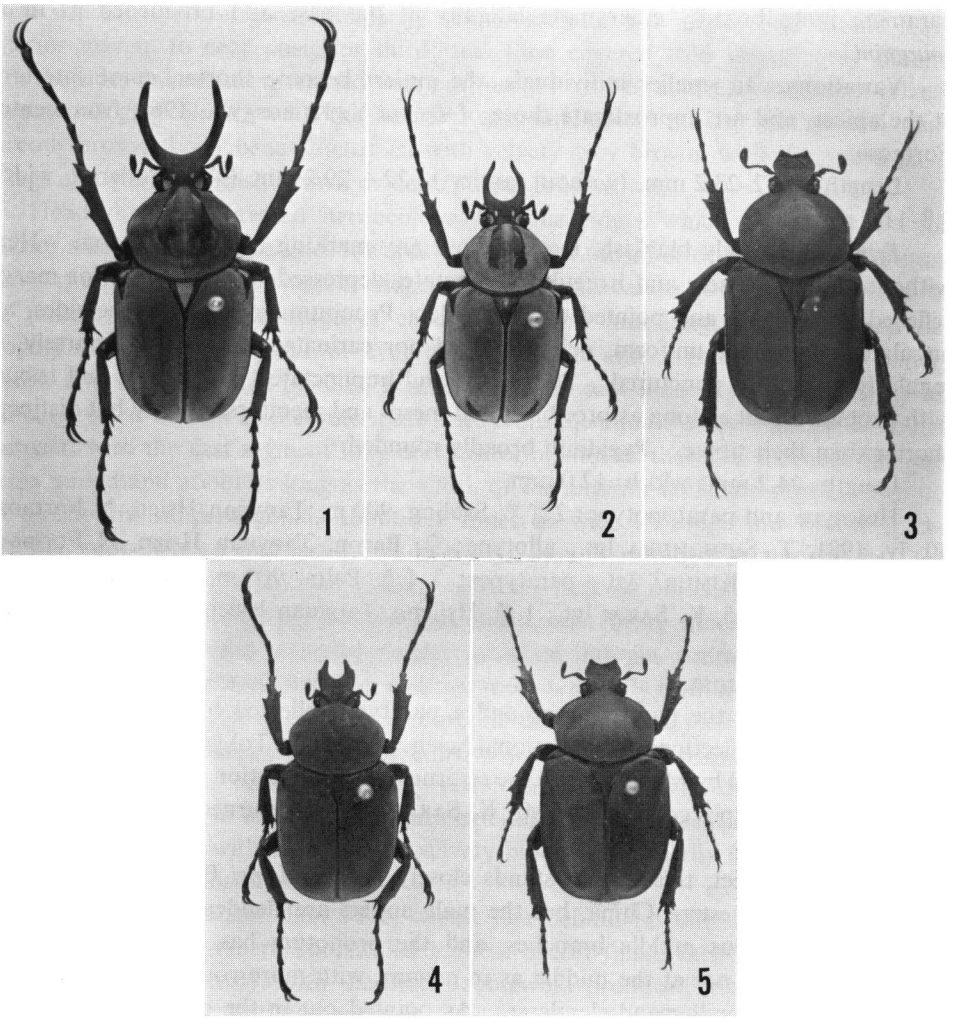
In every respect, this species stands closely by *D. adamsi* PASCOE, 1863, known from Korea and western China, but the male antlers are slenderer, with smaller and rather inconspicuous middle branches, and the pronotum has the widest part just before the middle, not at the middle as in *adamsi*, with more rounded sides and with the discal ridges smaller and slenderer. As pointed out in the description, the male antler of the smaller examples are shorter and more strongly curved interiorly than in the same-sized examples of *adamsi*.

Since specimens of *D. yui* from the basin of the River Lao-Lung Chi, Kao-Hsiung Hsien in southern Formosa are different from typical *yui* Y. KUROSAWA, 1968, from central Formosa, I will describe it as a new subspecies as shown in the following lines.

Dicranocephalus yui cheni subsp. nov.

Dicranocephalus yui: HIRASAWA, 1984, New Entomologist, Ueda, **32**: 82.

Different from *D. yui yui* Y. KUROSAWA from central Formosa in the following



Figs. 1–5. New *Dicranocephalus* from Formosa. —— 1. *D. shimomurai* Y. KUROSAWA, nov., major ♂, Palin, Taoyuan Hsien, N Formosa, 1. v. 1985, K. SAKAI lgt. (paratype). —— 2. Do., minor ♂, Palin, Taoyuan Hsien, N Formosa, 1. v. 1985, K. SAKAI lgt. (paratype). —— 3. Do., ♀, Baron, Taoyuan Hsien, N Formosa, 2–5. v. 1984, M. KIMURA lgt. (allotype). —— 4. *D. yui cheni* Y. KUROSAWA, nov., ♂, Tengtzi, Kaohsiung Hsien, S Formosa, 6. v. 1983, W. L. CHEN lgt. (holotype). —— 5. Do., ♀, vic. Paoshan, near Liukuei, Kaohsiung Hsien, S Formosa, 9. viii. 1978, W. L. CHEN lgt. (paratype).

points:

Male. Above darker, with a slight dark velvety olivaceous tinge and darker legs; basal segment of each antenna distinctly shorter than the five following segments united, while in *yui* s. str., the basal segment is slightly shorter or about as long as the

five following segments united; antlers shorter and robuster; pronotum broader, with the sides more strongly rounded antero-laterally.

Length: 17.6–19.2 mm (without antlers), 18.5–21.2 mm (with antlers); width: 9.0–10.0 mm.

Female. As the female of *yui* s. str. is still unknown, it is impossible to make a comparison between the females of the two subspecies. The female of *yui cheni* was already described by H. HIRASAWA in 1984 under the name of *yui* s. str.

Length: 19.5–21.3 mm; width: 19.0–21.5 mm.

Holotype (♂) and allotopotype (♀): 1 ♂ 1 ♀, Tengtzi, Kao-Hsiung Hsien, S Formosa, 6. v. 1983, W. L. CHEN lgt.; paratypes: 2 ♀♀, Vic. Paoshan, Near Liukuei, Kao-Hsiung Hsien, S Formosa; 6 ♂♂, Fujieda (in Japanese), Kao-Hsiung, S Formosa, 2–4. v. 1983, W. L. CHEN lgt.; 2 ♀♀, do., 29. v. 1983, W. L. CHEN lgt.

Range: Southern Formosa.

The dark blackish body without markings is common to the females of *D. adamsi*, *shimomurai* and *yui*. This may be regarded as the main characteristics of the *adamsi* species-group of the genus *Dicranocephalus*. Of the other species of the genus, *uenoi* Y. KUROSAWA, 1968, is peculiar in every respect, especially in the pilose body including pronotum and elytra, and forms a unique group. The remaining five species, *beiti* POUILLAUDE, 1914, *bourgoini* POUILLAUDE, 1914, *bowringi* PASCOE, 1863, *dabryi* AUZOUX, 1869, and *wallichii* HOPE, 1831, have the body and elytra more or less ornamented with velvety bloom. These five may form another species-group called the *wallichii* group.

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