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Dear Dr Konishi:

I am preparing to return your specimens. I have been working on them with great interest the past few months, and have been happy to be able to compare them to the specimens of the Entomological laboratory of the Uiversity of Osaka and the collection of the Osaka Museum of Natural History.

I am writing a key to the Japanese Trigonalyidae. Previous keys (Tsuneki, 1991; Teranishi 1929, also Chen 1949) have been in part keys to specimens or just one sex. I hope to remedy this. However, I am not free from the constraints faced by these previous workers: the group is a difficult one and complete material is lacking for some species.

This problem has been aggravated by the new genera and species recently described by the late Dr. Tsuneki. For example, he described a new genus and seven species apparently from 8 specimens 5 of which were all collected on the day. He may be correct about some of them, but I am certain the paratype of the type species is a synonym of another genus. (from Taiwan)

Would you be interested in co-authoring this work, possibly with Dr Sk. Yamane? I would like to publish a key in a Japanese journal to help encourage the recognition and appreciation of the Trigonalyidae of Japan. I would like to see the information available in both English and Japanese. Is there a Japanese journal that you would recommend?

Sincerely yours,

David Carmean

To change in paper: P.yuasi seen

Tentative Key to Japanese (and other Asian) Trigonalyidae

	M, a/b	M2, a/b	M w/l	M2 w/l	F, a/b	F2, a/b	F w/l	F2 w/l
Teranishia nipponica					1.727		1.407	
Genus1:(Orthogonalys)	1.366		1.867					
flavocincta	2.136		1.316					
P. maga- male	1.70	1.895	1.619	1.565				
elongata			1.41					

Teranishia nipponica Tsuneki (Female paratype: OMNH] Shimajima; Nagano; vii-1927; K. Sato

lower of two tarsal teeth much fatter than upper tooth, which is very fine and not quite as long.
gt2 (22x)- 38 apical width 27long 22basal width.
Apex/Base (38.000/22.00) = 1.727. Widest point/Length (38.000/27)=1.407

Genus 1: (Orthogonalys)
[Ibaraki, 3M] Yaita; Tochigi Pref. 30,vi-15,vii. 1989; Malaise Trap; K. Konishi.
two tarsal teeth about same size and length
mandibles normal asymmetrical: 3left and 4 right.
30X, gt2 basally 41, length 30 , apically 56;
Apex/Base (56.000/41.00) = 1.366 Widest point/Length (56.000/30)=1.867

Male OMNH Taeniogonalos (Nanogonalos) flavocincta Teranishi (flavicincta on type label) suigen; v-1928; C.P.Clausen
[Label 2, Red] Holotype; Nanogonalos flavicincta [Label 3] 2303.
gt2 at 20X: apical width-47 length 38, width 50 at widest point; 22 width at base. ;
Apex/Base (47.000/22.00) = 2.136 Widest point/Length (50.000/38)=1.316
24 antennal segments, elongate tyloides 10-16 (last one short).
Large Flattened area on gs2 and smaller one on 3; no projections.

O. elongata with extensive white markings, as below but also on head below antennae; medial to eye, above back of eye;; apical half gt1, most of gs1, and faint markings on gt2.
[Ibaraki; 1 large F, 28 antennal segments] Mt Fuji; 22 VII 1956; J. Minami. [1F] Mt. Shiratori-yama; Izumi-mura (1300m); Kumamoto Pref.; 6 VI 1980; K. Ohara.
O. elongata: antenna banded white, mandibles all white,
thorax black with medial white spots on mesonotum, scutellum, dorsellum or just scutellum and dorsellum. Trochanters brownish
Submarginal cell II petiolate.
g1,2 possibly brownish laterally;
[OMNH, 1M- Mt Mt Hira; 18-vi-'29; C.T. [C. Teranishi] [Ibaraki, 1F] Nikenkoya,;Ikawamura;18-20 VII 1957; Shizuoka; Coll. J. Minamikawa.
55 width/39 t2 length Widest point/Length (55.000/39)=1.410

O. hagoromonis- Antennae all dark; mandibles white (including base) except teeth
thorax black with no light markings dorsally except tegula tan; trochanters white with some dark markings
wings submarginal cell II, with an X (not petiolate or broadly joined)
g1,2 reddish-brown crescent shaped marking laterally, or more extensive; gt1 without medial concavity or furrow; gt2,3 apically indented medially;
[Ibaraki, 1M, abdomen all dark, without reddish brown markings, genitalia exposed] Mt. Takao; Tokyo; 15 v1966;Coll. J. Minamikawa.
[1F] Mt. Takao; Tokyo; 17 v1964; Coll. J. Minamikawa.
[1F] Mt. Takao; Tokyo; 3 v1964; Coll. J. Minamikawa.
[1F] Mt. Takao; Tokyo; 3 v1964; Coll. J. Minamikawa.

[Ibaraki, 1M, genitalia slightly exposed] Mt. Takao; Tokyo; 3v1964;Coll. J. Minamikawa. [1F] Mt. Takao; Tokyo; 6 VI 1965; Coll. J. Minamikawa. [[1M] VII-30-1954; Mt. Norikura; S. Kato.

P. maga- male: hind trochanters white
male
gt2 at 20X: apical width-34 length 21, width at widest point same; 20 width at base.
Apex/Base (34.000/20.00) = 1.700. Widest point/Length (34.000/21)=1.619

gt2 at 20X: apical width-36 length 23, width at widest point 36; 19 width at base.
Apex/Base (36.000/19.00) = 1.895. Widest point/Length (36.000/23)=1.565
F: [Ibaraki, 1F] 10-IX-1951; Kamikoti; H. Hasegawa. [On back of label- Kamikoti-; Myozin ike
This female has apical portion of first segment and most of second trochanters white, all of third trochanter white. [male with mandible all dark; first segment of third trochanter only apically white]
Wing with sub apical dark marking.
GS2 slightly flattened ventrally and GS3 has the slightest ridge tangentally. GT2 ratio: 28 width/21 t2 length. Basally t2 is (20X) 25units, apically 45units.
Apex/Base (45.000/25.00) = 1.440. Widest point/Length (45.000/21)=2.143 ??xxx check these
Gt1 with spoon-shaped concavity basally.
All dark dorsally except apex of gt1 and gt2, both medially divided. Mandible with light marking medially. Fore femur generally lighter.
T. maga [Ibaraki, 2M, 1M] Yaita; Tochigi Pref. 30,vi-15,vii. 1989; Malaise Trap; K. Konishi. These are generally darker- hind trochanters white, base of 2nd &3rd femurs white; light to almost no marking at mid mandible.
Taeniogonalos maga? female, hind trochanters only white, forefemurs lighter, gt2 with light marking divided medially; otherwise all black. gs2 swollen ventrally. Entire wing, especially marginal cell smokey. [Ibaraki, 1F] VIII. 10, 1982.; Chichibu; Saitama Pref.; H. Hasegawa.

1. Hind trochanters apparently three segmented, the second true segment diagonally divided. Dorsellum flat or only humped. In Japan, females never with armature, male antennae variable. 2

- Hind trochanters apparently two segmented, the second segment not diagonally divided. Dorsellum Pyramidal and bifid. Female with armature, male antennae without tyloides .....Bareogonalos jezoensis

2 Thorax mostly rufous. Anterior half of very tip of wing smokey- Taeniogonalos fasciata

- Thorax black or black with light markings. Wings variable. 3

3. Mesonotum and metanotum with light medial marking. Middle of antenna with light markings. Orthogonalys elongata

- Thorax generally all black 5

4.

- First two gastral terga fused medially. Antenna all black Pronotum sometimes with medial light marking. ..... Genus 2

5.

- Dorsellum flat or only humped. 2

Tentative Key to New World *Taeniogonalos*[1]

1. Mesopleuron and mesosternum mostly yellow. Tyloides less than half length of flagellomere. Central America 2

- Mesopleuron often dark, if mostly yellow, then mesosternum amber or dark. Middle tyloides usually longer than half length of flagellomere. Cosmopolitan. 3

2. Body with extensive yellow markings, metasomal terga with distinct yellow transverse stripes .....*T. ornata*

- Body dark, metasomal terga without distinct yellow stripes except petiole .....*T.* (xx) species 4

3. Female with armature on sternum II, male with distinctly flattened or concave area on sternum II 4

- Female without armature, sternum II rounded and without projections; male sternum rounded or convex, not flattened 6

4. South America .....*T. lugubris* and related undescribed species

- North and Central America, Greater Antilles 5

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[1]One undescribed black male from Costa Rica (AEI) has antennae like *Lycogaster* but with tyloides, the rest of its characters as in Taeniogonalini.

5. Scutellum black. Anterior half of forewing including basal cell blackish. Hispaniola. (Known from single female, CNCC) .....*T.* sp. xx

- Scutellum with two parallel yellow marks, may diverge slightly anteriorly or may expand to cover entire scutellum. Anterior half of forewing may be amber or smoky, but basal cell not darkened .....T. gundlachii

[Intermediate forms of *T. gundlachii* are known from Florida]

5a. Gena mostly yellow. Scape completely and much of frons above antennae yellow. Scutellum all yellow. Cuba .....*T. gundlachii*

- Gena mostly dark. Scape amber to dark and frons above antennae mostly dark. Scutellum variable. North and Central America. .*T. costalis* -> *gundlachii*

6. Mesopleuron with posteror half of area between midcoxa and sternaulus amber 7

- Mesopleuron without amber markings (the correct delineation of the following species(?) will need additional specimens) 9

7. Body light brown, scutellum dark without light marks .....*T. jucunda*

- Body dark brown to black, scutellum various 8

8. Body black with yellow markings, scutellum with two yellow marks converging anteriorly (rarely scutellum completely dark or yellow). South America .....*T. enderleini*

- Body dark brown, scutellum without markings. Central America (Rare dark specimens may key here) .....*T.* nr. *ornata*

9. Central America. Scutellum with two yellow marks converging anteriorly (rarely scutellum completely dark; if head all black, see *T.* nr. *onata*?) .....*T. fasciatipennis*

- South America. 10

10. Antennal socket without well developed lobe above it. Body shiny black with light yellow markings (older specimens may be dark brown). Peru, Bolivia, Columbia, and Ecuador .....Species a

- Antennal socket with well developed lobe just mesad and above antennal socket covering torulus. Mesosoma and metasoma, except petiole, densely punctate,

dull, not shiny
.....Species b

Fig. 7, right lateral view. a. Pronotal collar rising gently. b. Pronotal collar raised so as to form a vertical posterior facing surface. There are intermediate states.

Key to Species of *Trigonalys*

1. Pronotal collar not raised (Fig. 7a) 2
- Pronotal collar raised (Fig. 7b) 5

2. Occipital carina at top of head behind vertex with wide flange, clear to translucent at edge .....Undescribed sp(p) from Brazil and Panama.
- Occipital carina not much wider at top of head, translucent to opaque 3

3. Body dark brown and yellow. South America .....*T. sanctaecatharinae*
- Body black and white 4

4. Tergum I with apex rounded (Fig. 8a). Female without armature. South America. Commonly collected .....*T. melanoleuca*
- Tergum I with apex nearly straight across (Fig. 8b). Female with armature on sternum III. Central and South America. Rarely collected. .....*T. championi* and related, undescribed species

5. Head with stripes at vertex. Thorax with yellow markings. New World (Central America) 6
- Head not striped. Thorax black or black with white markings. Old World 7

6. Metasoma strongly striped. Dark triangular mark at top of gena .....*T. maculifrons*

- Metasoma at most weakly striped. No triangular mark at top of gena ....*T. flavescens*

7 (triplet). India. Female metasoma reddish brown (except petiole). Male metasoma appears black but is dark reddish brown when compared to thorax ....*T. rufiventris*

- Philippines. Armature sub-apical pointed thorn on sternum III .....*T. lachrymosa*
- Africa. Tergum II with oblique ivory bars not meeting in middle. Dorsellum with ivory on anterior portion. Armature small bifid tooth on sternum III .....*T. natalensis*

Related African species differ in armature and markings.

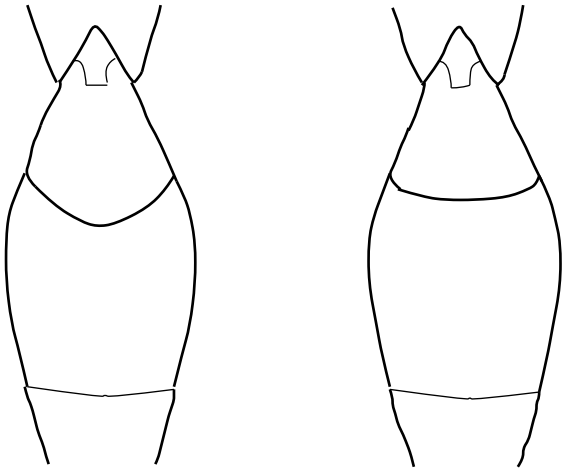

Fig. 8, dorsal view. *Trigonalys melanoleuca* (left) vs. *Trigonalys championi* and related species. The apex of the petiole is rounded in *T. melanoleuca*.

Key to Seminota

1. Basal portion of wing including costal cell hyaline. Submarginal cell II not petiolate .....*S. leprieurii*

- Basal portion of wing including at least costal cell black. Submarginal cell II usually petiolate 2

2. Petiole dorsally with sparse long pubescence, distinctly less dense than that of tergum II (viewed laterally with fiber optic light at 30X; if it is possible to count

the number of hairs in any one view and to follow many of the hairs to their bases, then pubescence is sparse) 3

- Petiole with dense erect hairs, not distinctly less dense than tergum II. Near the petiolar apex, hairs are too dense to count or view separately at their bases 4

3. Occipital carina not distinct. Petiole broad with dorsal spoon-shaped median furrow, often with 2 yellow spots. Costa Rica to Brazil.....*S. depressa*

- Occipital carina distinct, visible from behind below sharp angle of vertex as well as inside genal angle. Petiole narrow, with dorsal median furrow elongate and parallel sided, not spoon shaped. Central America .....*S. laeviceps*

4. Forewing apical third with whitish haze, due to dense white or tan pubescence near wing tip, but wing membrane apically hyaline. Basal half of forewing dark fuscous. Subdiscal cell I dark, or mostly dark. Propodeal pubescence golden or dark brown. Occipital carina distinct medially. Mexico .....*S. mexicanus*

- Forewing with leading part fuscous, tip not whitish. Subdiscal cell I hyaline or mostly hyaline. Propodeal pubescence white. Occipital carina fades medially (at top) near vertex. South America .....*S. marginata*