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A new species of the genus *Alulatettix* (Orthoptera: Tetrigidae) from Taiwan

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Abstract

Alulatettix angustivertex n. sp. is described with illustrations of external morphology and female genitalia in detail. Comparison between the species *A. angustivertex* n. sp. and the other species of the genus *Alulatettix* is compiled into a table for identification. The distribution map of this species in Taiwan and its offshore islands is also provided.

Key words

Tetrigidae, *Alulatettix*, new species, Taiwan

Introduction

Alulatettix Liang 1993 is a small genus of Tetrigidae. There are 3 species of this genus that have been found in China, *i.e.*, *A. yunnanensis* Liang, 1993, from Yunnan, *A. wudanshanensis* Wang & Zheng, 1997, from Hubei, and *A. zhengi* Niu, 1994, from Henan. Some species from Japan (Ichikawa, 1993), some from Guangxi have been published (Jiang & Zheng, 1998), and 2 species from Hubei (Zhong & Zheng, 2003) as members of the genus. The only revision of the genus is by Zheng and Zhong (2001). The genus *Alulatettix* is recorded here for the first time in Taiwan.

Alulatettix angustivertex, n. sp. (Figs 1-12)

General Coloration.— General color brown. Posterior part of vertex with pair of black spots posteriorly. Eyes dark brown. Tip of each antennal segment ringed with yellow, and tip of last segment white. Middle femur dark-brown upper margin with 2 white marks, paginal area with 5 irregular yellow spots, arranged in line medially, lower margin area with rectangular brown spots at base. Hind femur brown, upper margin area with 2 small dark-brown bands, paginal area dark brown at base; lower margin area dark brown; apex of hind femur dark brown. Hind tarsi with 1st one light brown, apical 2 brown.

External morphology.— ♂: vertex narrow, protruding indistinctly over the eyes, anterior margin bordered with carinae, the middle and lateral ones distinctly connected; middle carina running into frons anteriorly, lateral and middle carinae connected and bordering anterior margin of vertex distinctly; all carinae extending posteriorly to 1/3 width of eyes; area between carinae forming a concave fossa. Vertex about 1.1 × as wide as eye. Head in lateral view with frontal carinae strongly curved inward at level of eyes, slightly protruding at level of antennae. Longitudinal groove of frontal fossae narrower than diameter of antennal socket. Lateral ocelli situated right at middle, in front of the eyes. Antennae filiform, 15-segmented, situated at inner sides of ventral margin of the eyes, the length of the 8th segment [=middle segment of Liang (1993)] about 5 × its width. Pronotum tectiform, dorsal margin arched in profile; anterior margin straight. Length of prozona about 1.3 × its width. Pronotal process reaching posterior end of abdomen, apex of process incised triangularly at middle. Two short carinae on the protuberance at the anterior third of the pronotum; posterior margin of lateral lobes in lateral view with 2 sinuses, the first extremely shallow; posterior angles of lateral lobes rounded at apex. Forewing small, elliptic, invisible, covered by pronotum, about 2.5 × longer than broad; Hindwings strongly reduced as strips, about 3.3 × longer than broad, in lateral view slightly exposed by the pronotum. Middle femur oblong stout, about 2.5 × longer than broad, dorsal margin irregularly dentate, ventral margin sinuate, bordered with denticules. Hind femur club-like, about 2.5 × longer than broad; hind femur about 3 × wider than the middle femur; hind femur with both antegenicular and genicular denticles sharp; apex of lower marginal area round; dorsal margin dentate on apical third; ventral margin dentate on apical half. First segment of hind tarsi about 1.4 × longer than the 2nd and 3rd segments together. Pulvilli of 1st tarsal segment nearly triangular, tip sharp in profile, the first 2 pulvilli smaller than the 3rd one.

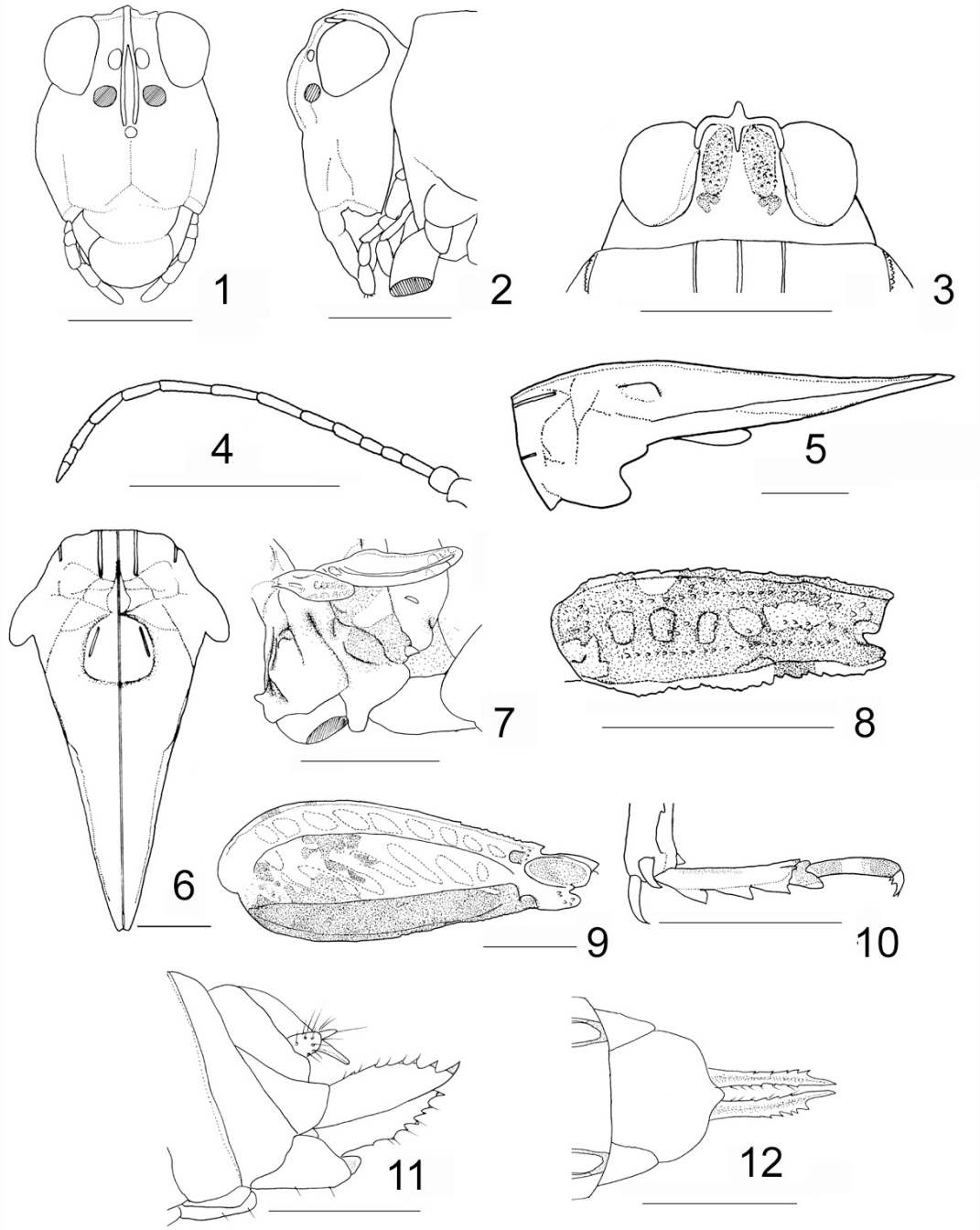
Female: Size in females slightly larger than in males, about 1.1: 1. Vertex about 1.2 × wider than the eye.
Female genitalia: Ovipositor valves thick and stout, surface smooth, each with 7 denticles at dorsal and ventral margin, about 3 × longer than broad. Subgenital plate subquadrate, narrower than long, about 1:1.3, posterior margin produced at the middle, triangular.

Measurements.— Data shown in Table 1.

Holotype.— ♂(1454-6), Taiwan: Taitung county: Orchid Island: Hontou: fields nearby Dragon-head Rock (Longtouyen) (long 121°35'16.116"E, lat 22°00'58.449"N) 29.viii.2001, Coll. M. Y. Tsai. (Deposited at Department of Entomology, National Chung Hsing University, Taichung, Taiwan).

Paratypes.— 1 ♂ (1373-01), Taiwan: Nantou county: Chushan: Wire pole (Linding GauhFen# 187) (long 120 40' 46.710"E/ lat 23 38'51. 634 N), 22.iv.2001, Coll. M. Y. Tsai. 1♀(1278-32), Taiwan: Kaohsiung county: Tengchih: forest road 400m beyond TESRI Experimental Station at middle-altitude (lat 23 04'31.266"N, long 120 45'03.009"E) 5.vii.2000, Coll. M. Y. Tsai. 4 ♀♀ (1487-01, 1487-02, 1487-03, 1487-04), Taiwan: Pingtung county: Lilongshan walking path (lat 23 01'50.032"N, long 121 08'38.994"E), 21-viii-2001, Coll.

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Figs 1-12. *Alulatettix angustivertex*, sp. nov.: 1. Head, anteroventral view, male. 2. Head, lateral view, male. 3. Head, dorsal view, male. 4. Antenna, lateral view, male. 5. Pronotum, lateral view, male. 6. Pronotum, dorsal view, male. 7. Wings and thoracic pleuron, dorsal field, male. 8. Middle femur, lateral view, male. 9. Hind femur, lateral view, male. 10. Hind tarsus, outer-lateral view. 11. Ovipositor, lateral view, female. 12. Ovipositor and subgenital plate, ventral view, female. (Scales = 1 mm).

J. H. Chen. 1 ♂ (1358-23), Taiwan: Pingtung county: Nanjenshan (lat 22 04'58.806''N, long 120 49'51.860''E), 09.ii.2001, Coll. J. H. Chen. 1 ♂ (1453-02), Taiwan: Taitung county: Orchid island: small path to Tein-Chih, in front of Chungai-Chiao bridge about 400m (lat 22 00'28.965''N, long 121 34'23.657''E), 29.viii.2001, Coll. M. Y. Tsai. 1 ♀ (1316-09), Taiwan: Taitung county: Taitung county road #23 4.5K (lat 22 58' 41.399''N, long 121 15'06.334''E), 21.vii.2000, Coll. M. Y. Tsai.

Distribution.— Taiwan (Fig. 13).

Etymology.— From the latin, *Angustus*, meaning 'narrow', in reference to the narrow vertex.

Diagnosis.— Features permitting dicrimination among species of *Alulatettix* and diagnosis of *A. angustivertex* are presented in Table 2.

Remarks: The new species is most similar to *Alulatettix wudangshanensis*, but is easily distinguished by morphological characters of the males as shown in Table 2.

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Table 1. Measurement of *Alulatettix angustivertex*, n. sp. (mm ± standard deviation).

Characters	Sex	
	♀(n=5)	♂(n=3)
Body length	6.93±0.41	6.30±0.05
Width of vertex	0.51±0.03	0.46±0.01
Width of eye	0.44±0.03	0.40±0.01
Length of pronotum	5.90±0.35	5.36±0.04
Width of pronotum	3.19±0.19	2.90±0.02
Length of middle femur	1.62±0.09	1.47±0.01
Width of middle femur	0.58±0.03	0.53±0.02
Length of hind femur	4.50±0.26	4.09±0.03
Width of hind femur	1.67±0.10	1.52±0.01
Length of ovipositor 1st valve	1.05±0.06	-
Width of ovipositor 1st valve	0.30±0.02	-
Length of ovipositor 2nd valve	0.89±0.05	-
Width of ovipositor 2nd valve	0.28±0.02	-
Length of subgenital plate	0.73±0.04	-
Width of subgenital plate	0.85±0.05	-



Fig. 13. Distribution of *Alulatettix angustivertex*, n. sp., in Taiwan. (⊙= collecting localities).

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Table 2. Comparison between *Alulatettix angustivertex* n. sp. and allied species.

Characters	*A. angustivertex* n. sp.	*A. wudangshanensis* Wang & Zhang	*A. wufengensis* Zhong & Zheng	*A. chuxiongensis* Zheng	*A. zhengi* Niu
Vertex wide/eye diameter	1.1	2.0	1.8*	1.6*	2.0
Antennal segments	15	12	14*	-	14
Length to width ratio of Middle segment of antennae	5	4.8	4.0*	-	5.0-6.0
Length/width ratio of hind femora	2.5	3.1	3.1*	3.0*	3.2
First segment/third segment ratio of hind tarsi	1.6	1.4	1.6*	1.6*	2
Anterior margin of vertex	straight	straight	nearly round*	nearly straight*	straight
Vertex together with frontal costa in angle	obtuse	right-angle	acute*	right-angle	acute
Frontal costa before lateral ocelli in angle	concaved	concaved	concaved*	straight*	slightly concaved
Anterior margin of pronotum	straight	nearly straight	obtusely protruding*	obtusely protruding*	obtusely protruding
Dorsal margin of pronotum in profile	slightly arched	wave-like	slightly arched*	distinctly arched*	distinctly arched
Apex of hind pronotal process	with a distinct triangular concavity	with a distinct triangular concavity	with a distinct triangular concavity*	with a distinct triangular concavity*	with a distinct triangular concavity
Ventral margin of middle femur in profile	sinuate	sinuate	sinuate*	sinuate*	straight
Characters	*A. guangxiensis* Zheng & Zhou	*A. anhuiensis* Zheng	*A. yunnanensis* Liang	*A. fornicata* (Ichikawa)	*A. bulbosus* Zheng & Zhong
Vertex wide/eye diameter ratio	1.5	2.0*	1.7	1.8	1.6
Antennal segments	14	-	12	13/14	13
Length to width ratio of Middle segment of antennae	5.7	-	4.5	4.0-5.0	4
Length/width ratio of hind femora	2.5	2.4*	2.8	3.5	2.8
First segment/third segment ratio of hind tarsi	1.3	2.0*	2.0	2.1	1.6
Anterior margin of vertex	straight	Round*	Round	straight	straight
Vertex meet frontal costa in angle	acute	obtuse*	acute	obtuse	right-angle
Frontal costa before lateral ocelli in profile	concaved	concaved*	slightly concaved	concaved	slightly concaved
Anterior margin of pronotum	acutely protruding	acutely protruding*	obtusely protruding	obtusely protruding	obtusely protruding
Dorsal margin of pronotum in profile	distinctly arched	distinctly arched*	slightly arched	distinctly arched	spherical-shaped
Apex of hind pronotal process	widely rounded	narrowly rounded*	widely rounded	narrowly rounded	narrowly rounded
Ventral margin of middle femur in profile	nearly Straight	nearly straight*	nearly straight	simate-like	nearly straight

Note: *: The sex of type is female. -: No descriptions or illustrations in the publications.

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