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TAXONOMIC REVIEW OF THE GENUS *YUNNANTETTIX* (ORTHOPTERA, TETRIGIDAE) FROM THE ORIENTAL REGION

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Taxonomic Review of the Genus *Yunnantettix* (Orthoptera, Tetrigidae) from the Oriental Region. Storozhenko, S. Yu., Pushkar, T. I. — Taxonomic review of the genus *Yunnantettix* Zheng, 1995 is given. It is similar to *Aspiditettix* Liang, 2009, *Pseudepitettix* Zheng, 1995, and *Epitettix* Hancock, 1907. *Yunnantettix* is the most similar to *Aspiditettix* in the general appearance, the rugose disc of the pronotum, and the bisinuate lateral lobe of the pronotum, and different from it by the completely reduced hind wing and the position of the antennal socket. *Yunnantettix* is similar to *Pseudepitettix* and *Epitettix* in the moderately widened frontal ridge and low median carina of pronotum, but different from the latter by the presence of the narrow tegmen and a shallow yet distinct tegminal (upper) sinus on the pronotal lateral lobe. Originally, *Yunnantettix* is a monotypic genus (type species: *Yunnantettix bannaensis* Zheng, 1995 from South China). Two species are additionally included to this genus: *Yunnantettix elytratus* (Günther, 1939), **comb. n.** (= *Epitettix elytratus* Günther, 1939) from India and *Yunnantettix thaicus*, **sp. n.** from Thailand. The new species differs from all other species of this genus by the shallow excision on apex of the posterior pronotal process and by the external lateral pronotal carina, arch-like and strongly curved upward above the tegmen. A key to the species and redescription of the genus *Yunnantettix* are provided.

Key words: *Yunnantettix*, Cladonotinae, Tetrigidae, Orthoptera, taxonomy, new species, new combination, Oriental Region.

Таксономический обзор рода *Yunnantettix* (Orthoptera, Tetrigidae) из Ориентальной области. Стороженко С. Ю., Пушкар Т. И. — Представлен таксономический обзор рода *Yunnantettix* Zheng, 1995. Этот род близок к родам *Aspiditettix* Liang, 2009, *Pseudepitettix* Zheng, 1995 и *Epitettix* Hancock, 1907. *Yunnantettix* наиболее сходен с *Aspiditettix* общим видом и морщинистым диском переднеспинки, но отличается полностью редуцированными задними крыльями и расположением усиковых впадин. *Yunnantettix* сходен с *Pseudepitettix* и *Epitettix* умеренно расширенным лобным ребром и низким срединным килем переднеспинки, отличаясь от обоих наличием узких надкрыльев и небольшой, но четкой крыловой (верхней) выемкой на боковых лопастях переднеспинки. *Yunnantettix* описан как монотипический род (типовой вид: *Yunnantettix bannaensis* Zheng, 1995 из Южного Китая). Еще два вида дополнительно включены в этот род: *Yunnantettix elytratus* (Günther, 1939), **comb. n.** (= *Epitettix elytratus* Günther, 1939) из Индии и *Yunnantettix thaicus*, **sp. n.** из Таиланда. Новый вид отличается от других видов рода наличием небольшой выемки на вершине заднего отростка переднеспинки и аркообразной формой внешних боковых килей переднеспинки, существенно изгибающихся над надкрыльями. Предложена таблица для определения видов и переописание рода *Yunnantettix*.

Ключевые слова: *Yunnantettix*, Cladonotinae, Tetrigidae, Orthoptera, таксономия, новый вид, новая комбинация, Ориентальная область.

Introduction

Originally monotypic genus *Yunnantettix* Zheng, 1995 was established for *Y. bannaensis* Zheng, 1995 from South China (Zheng, 1995), and it belongs to the tribe of Cladonotini. Two specimens of the new species of *Yunnantettix* were collected in Thailand by A. V. Gorochov, L. N. Anisyutkin, and V. G. Bezborodov. In addition, *Epitettix elytratus* Günther, 1939 from India, based on the analysis of its original description (Günther, 1939) and the redescription of the holotype (Shishodia, 1991), also belongs here. It allows to revise the description of this genus briefly given in Chinese by Zheng (1995). Thus, in the present paper we assert that the genus *Yunnantettix* contains three species distributed in India, China, and Thailand.

Material and methods

All photographs were made using Canon EOS D6 with EF 100 mm macro lens, Falcon Eyes Slk-2400S flash, and Combine ZM imaging software. The morphological terminology follows Storozhenko and Paik (2007), except for the detailed terminology of the pronotal carinae that follows Devriese (1999). The holotype and paratype of the new species are deposited in the Zoological Institute of the Russian Academy of Sciences, St.-Petersburg (ZISP). Type material of the other species is deposited at the Institute of Zoology, Shaanxi Normal University, China (SNNU) and the National Zoological Collections, Calcutta, India (NZC). The diagnostic characters and measurements of *Y. bannaensis* and *Y. elytratus* are provided by Günther (1939), Shishodia (1991), and Zheng (1995). All measurements are given in millimeters.

Family TETRIGIDAE Rambur, 1838
Subfamily Cladonotinae Bolívar, 1887
Tribe Cladonotini Bolívar, 1887
Genus *Yunnantettix* Zheng, 1995

Yunnantettix Zheng, 1995: 344; Liang, Zheng, 1998: 36; Zheng, 2005: 34; Liang et al., 2009: 258.

Type species: *Yunnantettix bannaensis* Zheng, 1995, by original designation.

Redescription. Body of moderate size, robust (fig. 14, 15). Head not protruding above pronotum in lateral view (fig. 1). Antenna filiform, 15-segmented (fig. 5), 1.3–1.4 times as long as fore femur; antennal socket situated at level of lower margin of eye (fig. 4). Eye subglobular, not protruding above vertex in lateral view (fig. 1). Fastigium of vertex in dorsal view between eyes considerably broader than width of eye, anterior margin of fastigium broadly rounded or angularly protruded in middle part; median fastigial carinula visible anteriorly, lateral fastigial carinula broadly rounded, supraocular lobe distinct (fig. 3); in lateral view fastigium protruded anteriorly about half or less of eye diameter (fig. 1). Frontal ridge in lateral view with two shallow excisions, one near lateral ocellus and another below antennal socket (fig. 1). Frontal ridge between bases of antennae 2.5 times as wide as first antennal segment; lateral ocellus placed near midlength of eye (fig. 4, 5). Apical segments of maxillary palp not widened. Pronotum in dorsal view with straight anterior margin; posterior pronotal process reaching abdominal apex or farther, but not apex of hind femur; posterior process apex excised or rounded (fig. 17, 19). Disc of pronotum depressed behind prozona and behind shoulders; prozona and area between shoulders convex; pronotal process with thick callosities and rugosities (fig. 15). Median carina of pronotum in lateral view rather low, lamellate, smooth in anterior half and sinuous posteriorly (fig. 1, 16, 18); prozonal lateral carina elevated; humero-apical carina short, internal lateral carina reaching apex of pronotal process; external lateral carina almost straight or arch-like in anterior half; interhumeral carina distinct but short. Hind margin of lateral lobe of pronotum bisinuate, tegminal (upper) sinus shallow; lower sinus deep (fig. 1, 2, 3); lower part of lateral lobe directed downward (typical for Cladonotinae), with rounded or obliquely truncate apex. Tegmen elongated, narrow, width of visible part of tegmen considerably less than width of mid femur; hind wing absent. Fore and mid femora with slightly sinuate lower carina (fig. 7); hind femur

stout, 2.3–2.6 times as long as wide (fig. 6). Basitarsus of hind leg considerably longer than third tarsal segment (without claws) (fig. 8). Male epiproct long, lingua-like (fig. 10). Male subgenital plate short, triangular in lateral view (fig. 9), ventral side with distinct median carinula (fig. 11). Female subgenital plate with angularly rounded posterior margin, median carinula weak (fig. 13). Valves of ovipositor narrow, dentate (fig. 12). Colour of body dark brown or ferruginous.

Comparison. The genus *Yunnantettix* is similar to *Epitettix* Hancock, 1907 with twelve species occurring in Malaysia (Borneo), Indonesia (Java), Papua-New Guinea, Vietnam, India and Madagascar (Storozhenko, 2012; Storozhenko, Dawwrueng, 2014; Eades et al., 2015), *Pseudepitettix* Zheng, 1995, with six species from China and Thailand (Zheng, 1995; Zheng, 2005; Storozhenko et Dawwrueng, 2014; Eades et al., 2015), and monotypic *Aspiditettix* Liang, 2009 from China (Liang et al., 2009). *Yunnantettix* is similar to *Pseudepitettix* and *Epitettix* in the moderately widened frontal ridge and low median carina of pronotum but differs from the latter by the presence of a narrow tegmen and a shallow but distinct tegminal sinus on the lateral lobe of the pronotum (in *Epitettix* and *Pseudepitettix* the tegmen is absent and the lateral lobe of the pronotum with lower sinus only). *Yunnantettix* is the most similar to *Aspiditettix* in the general appearance, the rugose disc of the pronotum, and the bisinuate lateral lobe of the pronotum but differs from it by the completely reduced hind wing and the position of the antennal socket (in *Aspiditettix,* the hind wing almost reaches the apex of the pronotum and the antennal socket is situated distinctly below the lower margin of the eye).

The genera *Epitettix*, *Yunnantettix*, *Pseudepitettix*, and *Aspiditettix* form a group of similar genera in the tribe of Cladonotini, but the actual phylogenetic relationships of the species included in these four genera need an additional study based on a critical examination of all the described species.

The genus *Yunnantettix* includes three species occurring in India, China and Thailand. The description of the new species, a list of the species of genus, and a key to species are given below.

Yunnantettix thaicus Storozhenko et Pushkar, **sp. n.,** fig. 1–15

Material. Holotype ♂: Thailand: Province Nakhon Ratchasima, environs of National Park Khao Yai, 500–1000 m, 26.10–4.11.2000 (A. V. Gorochov, L. N. Anisyutkin). Paratype ♀: Thailand: Province Loei, Phu Reua, 735 m, 26.05.2010 (V. G. Bezborodov) (ZISP).

Diagnosis. The new species differs from all the other species of this genus by the shallow excision on the apex of the posterior pronotal process and by the shape of the external lateral pronotal carina, which are arch-like and strongly curved upward above the tegmen.

Description. Male. Fastigium of vertex in dorsal view between eyes 2.8 times as wide as eye, anterior margin of fastigium broadly rounded, reaching further than anterior edge of eye. Frontal ridge in lateral view with two shallow excisions: between lateral ocelli and below antennal socket; in frontal view, with distinctly divergent and smooth lateral carinae; frontal ridge between bases of antennae 2.5 times as wide as antennal socket; median furrow distinct above median ocellus. Median carina of frontal ridge 2.2 times as long as width of first antennal segment. Mid segments of antenna 4.5–5.5 times as long as wide. Prozona 1.4 times as wide as long. Median carina of pronotum in lateral view almost straight in front of tegmen, but slightly concave near shoulders, and sinuous posteriorly. Prozonal lateral carina serrate; interhumeral carinae between shoulders short, parallel; external lateral carina almost reaching apex of pronotum and strongly curved upward above tegmen. Apex of posterior pronotal process in dorsal view shallowly excised. Tegmen narrow, its visible part 3.6 times as long as wide and 3.2 times

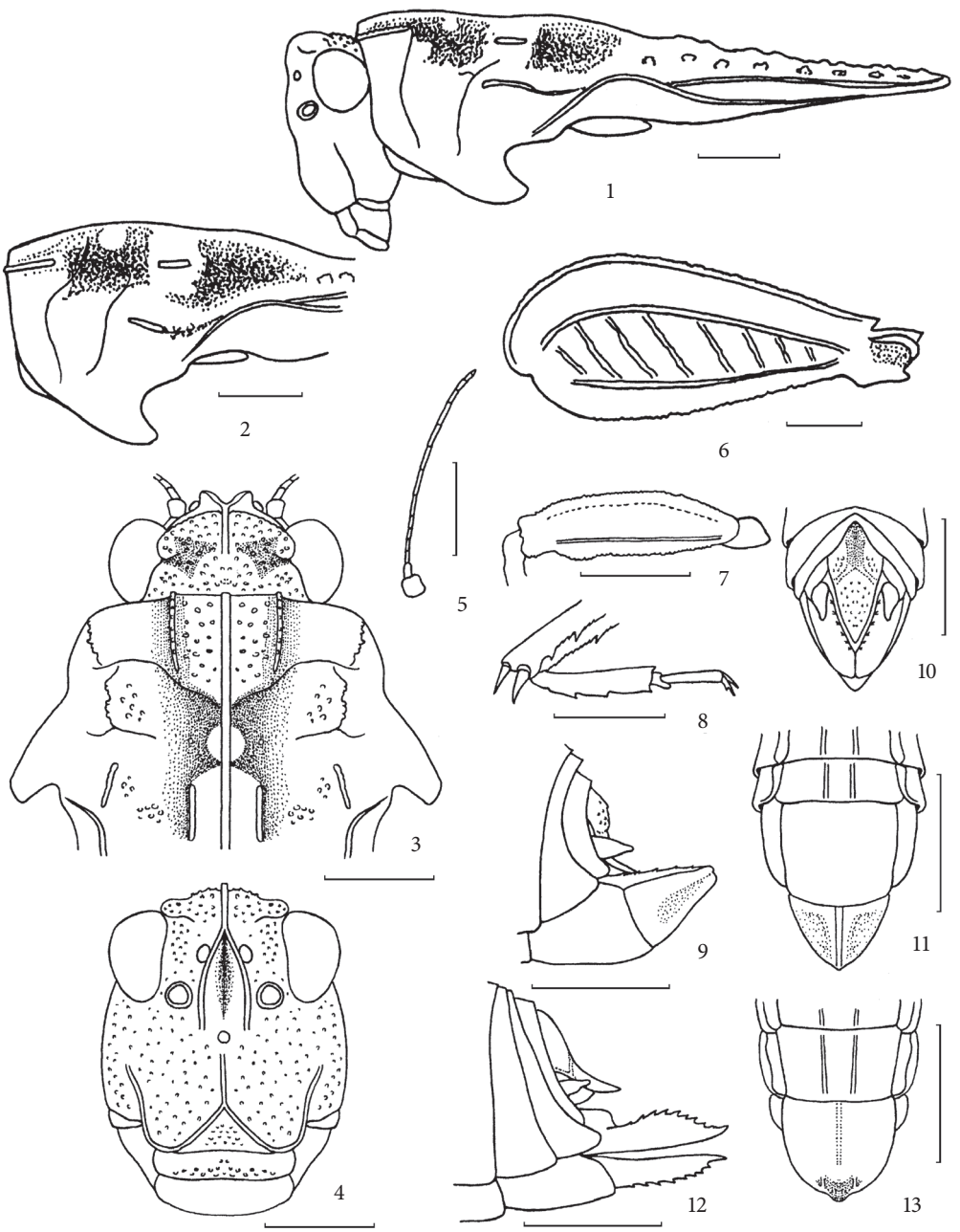

Fig. 1–13. *Yunnantettix thaicus* sp. n.: 1 — male head and pronotum, lateral view; 2 — female anterior part of pronotum, lateral view; 3 — male head and anterior part of pronotum, dorsal view; 4 — male head, frontal view; 5 — female antenna, dorsal view; 6 — male hind femur, lateral view; 7 — male fore femur, lateral view; 8 — male hind tarsus, lateral view; 9 — male apex of abdomen, lateral view; 10 — the same, dorsal view; 11 — the same, ventral view; 12 — female apex of abdomen, lateral view; 13 — female 7th sternite and subgenital plate, ventral view. Scale bars 1 mm.

Рис. 1–13. *Yunnantettix thaicus* sp. n.: 1 — голова и переднеспинка самца, вид сбоку; 2 — передняя часть переднеспинки самки, вид сбоку; 3 — голова и передняя часть переднеспинки самца, вид сверху; 4 — голова самца, вид спереди; 5 — усик самки, вид сверху; 6 — заднее бедро самца, вид сбоку; 7 — переднее бедро самца, вид сбоку; 8 — задняя лапка самца, вид сбоку; 9 — вершина брюшка самца, вид сбоку; 10 — то же, вид сверху; 11 — то же, вид снизу; 12 — вершина брюшка самки, вид сбоку; 13 — 7-й стернит и генитальная пластинка самки, вид снизу. Масштабные линейки 1 мм.

Fig. 14–15. *Yunnantettix thaicus* sp. n.: 14 — male body, dorsal view; 15 — female, lateral view.

Рис. 14–15. *Yunnantettix thaicus* sp. n.: 14 — самец, общий вид сверху; 15 — самка, общий вид сбоку.

narrower than maximal width of mid femur. Hind wing absent. Fore femur 3.3 times as long as wide, with slightly sinuate and finely dentate lower carina; mid femur 2.9 times as long as wide, with distinctly sinuate lower carina. Basitarsus of fore leg considerably shorter than second tarsal segment (without claws). Hind femur stout, 2.6 times as long as wide; upper and lower carina slightly granulated. Upper margin of hind tibia finely serrated, with 5–6 outer and 4 inner teeth. Basitarsus of hind leg 2.3 times as long as third tarsal segment (without claws); all basal pads of basitarsus almost equal. Epiproct narrow, 2.1 times as long as wide near base. Subgenital plate in ventral view 1.4 times as long as wide; in lateral view 1.4 times as long as tall, with slightly excised apex. Cerci conical with a narrowly rounded apex, 1.9 times as long as wide near base.

Body ferruginous brown, with blackish spots. Antenna brown; apices of segments with narrow light rings. Posterior pronotal process with light brown area between internal and external lateral carinae. Visible part of tegmen dark brown without spots. Fore and mid tibiae light brown with two blackish rings. Fore tarsus blackish, second segment with broad whitish ring near middle; claws light brown. Hind femur ferruginous brown. Hind tibia brown with two light rings, one in basal third and another in apical third of tibia. Basitarsus of hind leg brown, second tarsal segment blackish, third segment also blackish, but with broad brown ring near middle; claws light brown. Lateral sides of tergites black with light brown longitudinal stripes. Sternites brown, except ninth sternite and subgenital plate blackish brown. Epiproct and cerci brown.

Female. Similar to male, but smaller. Fastigium of vertex in dorsal view between eyes 2.7 times as wide as eye. Frontal ridge same as in male; frontal ridge between bases of antennae 2.5 times as wide as antennal socket; median furrow distinct. Median carina of frontal ridge 2.0 times as long as width of first antennal segment. Mid segments of antenna 4.0–4.8 times as long as wide. Prozona 1.5 times as wide as long. Median carina, interhumeral carina and external lateral carina of pronotum as in male; prozonal lateral carina smooth. Visible part of tegmen 3.5 times as long as wide, and 3.0 times narrower than maximal width of mid femur. Hind wing absent. Fore and mid leg as in male, fore femur 3.0 times, mid femur 2.6 times, hind femur 2.5 times as long as wide. Upper margin

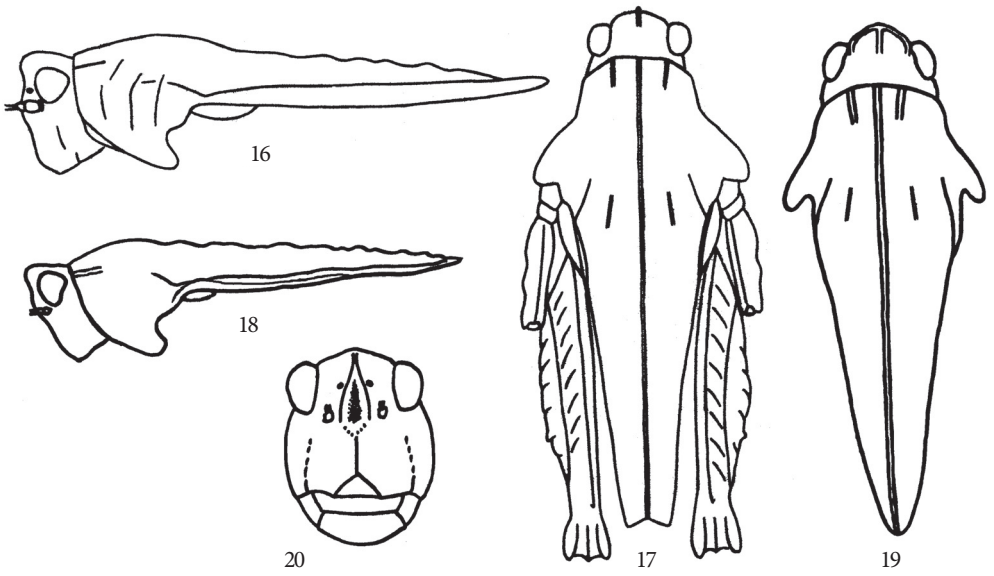

Fig. 16–20. *Yunnantettix bannanensis*, male (16–17) and *Y. elytratus*, female (18–20): 16, 18 — head and pronotum, lateral view; 17 — body, dorsal view; 19 — head and pronotum, dorsal view; 20 — head, frontal view (16–17 after Zheng, 1995; 18–19 after Günther, 1939, with modification; 20 after Shishodia, 1991).

Рис. 16–20. *Yunnantettix bannanensis*, самец (16–17) and *Y. elytratus*, самка (18–20): 16, 18 — голова и переднеспинка, вид сбоку; 17 — общий вид сверху; 19 — голова и переднеспинка, вид сверху; 20 — голова, вид спереди (16–17 по: Zheng, 1995; 18–19 по: Günther, 1939, с изменениями; 20 по: Shishodia, 1991).

of hind tibia with 6–7 outer and 3 inner teeth. Basitarsus of hind leg 2.2 times longer than third tarsal segment (without claws); basal pads of basitarsus as in male. Subgenital plate 1.1 times as wide as long. Cerci with narrowly rounded apex, 1.4 times as long as wide near base. Upper valve of ovipositor 3.0 times as long as maximum width. Lower valve of ovipositor 4.6 times as long as maximum width.

Coloured as male, but second segment of fore and mid tarsi, as well as third segment of hind tarsus with broad light brown ring near middle. Hind tibia brown with light ring in basal third. Subgenital plate, epiproct and ovipositor blackish brown.

Measurements. Length: body (from frontal ridge to apex of subgenital plate): ♂ 9.5, ♀ 9.3; pronotum: ♂ 8.1, ♀ 8.0; antenna: ♂ 2.5, ♀ 2.6; tegmen: ♂ 0.9, ♀ 0.7; fore femur: ♂ 2.0, ♀ 1.8; mid femur: ♂ 2.3, ♀ 2.1; hind femur: ♂ 5.7, ♀ 5.5; ovipositor 1.1.

Distribution. Thailand (Provinces Nakhon Ratchasima and Loei).

Etymology. The new species is named thaicus (adjective masculine) after the type locality.

Yunnantettix bannaensis Zheng, 1995, fig. 16, 17

Yunnantettix bannaensis Zheng, 1995: 344, fig. 5, 6; Liang, Zheng, 1998: 37, fig. 21 a, b; Zheng, 2005: 35, fig. 73, 74.

Notes. This species was described based on two males (including holotype) and one female from Yunnan province of China (Jinghong, 22.1° N, 101.1° E, 1100 m, 6.05.1974) (Zheng, 1995). Material deposited in SNNU (not studied). The original description was given in Chinese with a very brief English summary. The additional information on *Y. bannaensis* is also in Chinese only (Liang, Zheng, 1998; Zheng, 2005).

Measurements (after Zheng, 1995). Length: body: ♂ 8.5–9.0, ♀ 11.0; pronotum: ♂ 7.5–8.0, ♀ 10.0; hind femur: ♂ 5.0–5.5, ♀ 6.0.

Distribution. China (Yunnan province).

Yunnantettix elytratus (Günther, 1939), comb. n., fig. 18–20

Epitettix elytratus Günther, 1939: 306, fig. 233, 234; Shishodia, 1991: 14, plate 3, fig. 2–4; Blackith, 1992: 49; Otte, 1997: 20.

Notes. This species was described based on a single female from India (East Himalayas [= West Bengal], Darjeeling district, Kalimpong, 200–1500 m, 04–05.1915) (Günther, 1939). Material is deposited in NZC (not studied). The holotype was redescribed and illustrated by Shishodia (1991). Males are unknown. By the presence of the narrow tegmen, the bisinuate hind margin of the lateral lobe of the pronotum (not only the lower sinus is present but also the shallow upper tegminal sinus), and the rugose disc of the pronotum, this species is similar to *Yunnantettix bannaensis* and transferred herein from *Epitettix* to *Yunnantettix* (see also Comparison, above).

Measurements (after Günther, 1939 and Shishodia, 1991). Length: body: ♀ 11.0; pronotum: ♀ 10.0; hind femur: ♀ 5.5; ovipositor 1.3.

Distribution. India (West Bengal).

Key to species of *Yunnantettix*

1. External lateral carina of pronotum above the tegmen strongly curved upward, arch-like (fig. 1, 2). Apex of posterior pronotal process with shallow excision. ..... *Yunnantettix thaicus* sp. n.
— External carina of pronotum above the tegmen only slightly curved upward or almost straight (fig. 16, 18). Apex of posterior pronotal process with deep excision or rounded (fig. 17, 19). 2
2. Apex of posterior pronotal process with deep excision (fig. 17). ..... *Y. bannaensis*
— Apex of posterior pronotal process rounded (fig. 19). ..... *Y. elytratus*

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