

Species of *Diaphanogryllacris* from Indochina and adjacent territories (Orthoptera: Stenopelmatidae: Gryllacridinae)

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7 new species of the genus *Diaphanogryllacris* Karny from Vietnam, China, and Thailand are described. *D. laeta* (Walk.) and *D. annamita* (Griff.), stat. n. are redescribed. A short diagnosis of the genus and new data on the distribution of some species are given.

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This paper is based on material from the collection of the Zoological Institute, Russian Academy of Sciences, St.Petersburg. The types of all the new species are kept in the same collection.

Genus *Diaphanogryllacris* Karny, 1937

Type species *Gryllacris translucens* Audinet-Serville, 1839 (Java, Sumatra?, Kalimantan?, India?).

Diagnosis. Size rather large. Coloration rather light (from cream-coloured to light brown) with dark or darkish ornament on head and pronotum, almost transparent wings (their venation from yellowish to very dark), more or less darkened spines of legs (sometimes tibiae and femora with darkenings also) and hind part of male abdomen. All ocelli small. Pronotum with short hind lobe of disc (Figs 1-12). Wings from long to shortened. Fore and middle femora unarmed; fore tibiae with 5 pairs of more or less long lower spines; middle tibiae with similar spines and 1 upper inner apical spine; hind femora with short lower spines along both inner and outer edges; hind tibiae with short upper spines along both edges and several longer apical and subapical spines. Abdomen of both sexes with 2 oblique rows of stridulatory teeth at lateral sides of 2nd and 3rd tergites. Male abdomen with large cup-like 9th tergite provided with median elevation at hind (lower) part; paired hooks of this tergite not contacting with each other, with distal spine directed downwards; paired

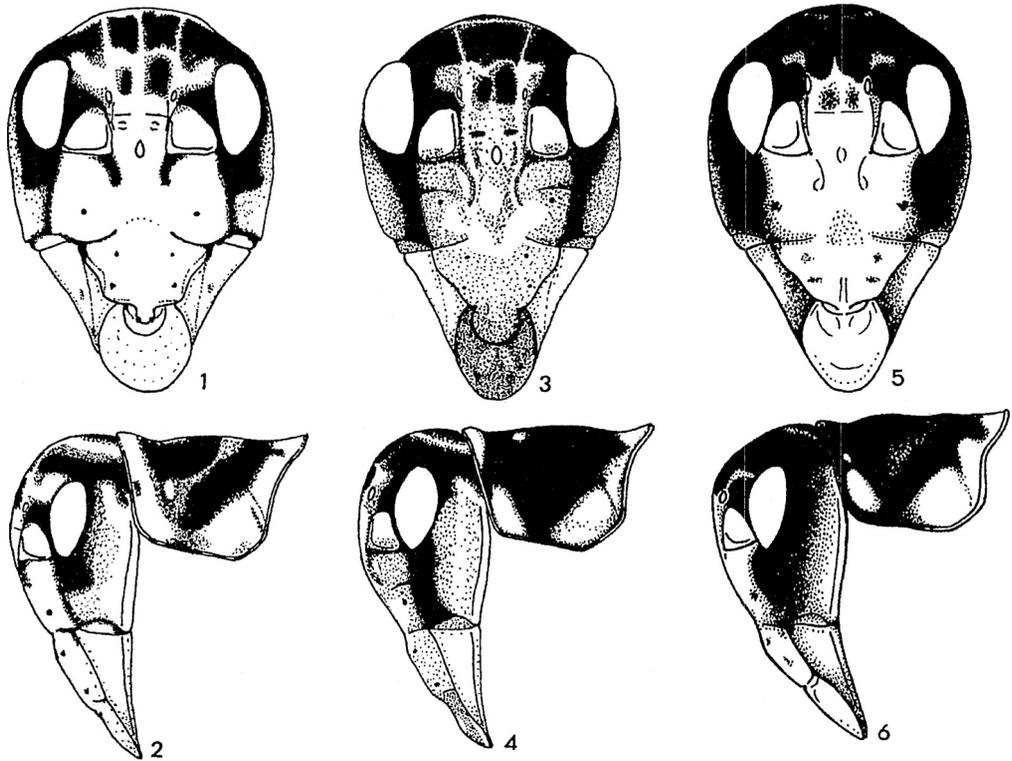
hooks of 10th male abdominal tergite shorter, contacting or almost contacting with each other, and directed upwards; male genitalia membranous or almost membranous, but with characteristic spine-like sclerite at apex of dorsai lobe (Figs 13-29). Female abdomen with membranous basal part of genital plate and specialized (more or less reduced) 7th sternite; membranous parts near this sternite with numerous small transverse folds (Figs 30-40); ovipositor long and more or less straight, with smooth edges and narrowly rounded apex.

Included species: type species, *Locusta gladiator* Fabricius, 1793 (India), *Gryllacris tibialis* Audinet-Serville, 1839 (Java), *Acheta aequalis* Walker, 1859 (Sri Lanka, India), *G. collaris* Walker, 1869 (Bangladesh), *G. laeta* Walker, 1869 (China, Vietnam), *G. postica* Walker, 1869 (India), *G. trinotata* Walker, 1870 (India), *G. annamita* Griffini, 1909, stat. n. (Vietnam), *D. normalis* sp. n., *D. simulator* sp. n., *D. panfilovi* sp. n., *D. insignis* sp. n., *D. propria* sp. n., *D. albifrons* sp. n., *D. pellucens* sp. n.

Diaphanogryllacris normalis sp.n. (Figs 1, 2, 13, 21, 30)

Holotype. ♂, Vietnam, prov. Vinh Phu, Tam Dao, 800-900 m, primary forest, 1-11.VI.1995 (A. Gorochov).

Paratypes. Vietnam: 5 ♂, 4 ♀, same data as holotype, but 17.V-11.VI.1995 (A. Gorochov), 15.V-5.VII.1997 (N. Orlov), 3.IV.1994 (A. Monastyrskij); 1 ♂, 1 ♀, prov. Cao Bang, distr. Nguen Binh, Quang Thanh, 4-13.V.1998 (N. Orlov).



Figs 1-6. *Diaphanogryllacris*. 1, 2, *D. normalis* sp. n. (holotype); 3, 4, *D. laeta* (Walk.); 5, 6, *D. annamita* (Griff.). Head in front (1, 3, 5); head and pronotum from side (2, 4, 6).

Description. Male (holotype). Head with narrow black transverse band over eyes; this band thrice interrupted in median part; hind part of vertex light with small dark spots; dark vertical stripe along hind part of eyes and under them rather narrow and slight; labrum and mandibles light (Figs 1, 2). Pronotum dark with rather wide light border along all edges and almost indistinct lightish ornament in central part (Fig. 2). Femora with darkish apical part; hind femora with black spines; tibiae light with black spines (spines of fore and middle tibiae with light apices). Wings slightly shortened (their apices extending to middle parts of hind tibiae; tegmina about 2.5 times as long as broad), transparent; most of veins yellow, but several veins brown. Apex of abdomen as in Fig. 13; genitalia membranous, except for spine-like sclerite (Fig. 21).

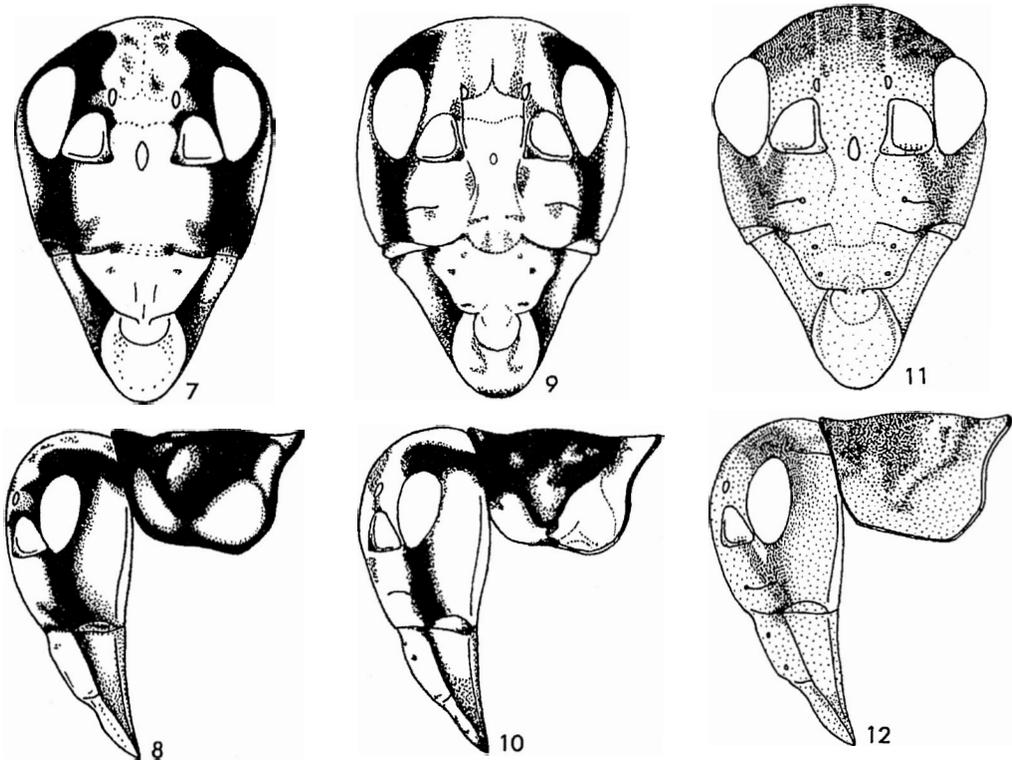
Variations. Some paratypes with slightly darker or lighter coloration of head and pronotum; venation of tegmina from almost entirely yellow to almost entirely brown; ti-

biae and abdominal apex sometimes distinctly darkened.

Female. Similar to male in general appearance. Ovipositor about 1.5 times as long as hind femora; 7th abdominal sternite rather small and semimembranous, separated from 6th abdominal sternite by rather wide membranous area; genital plate with almost triangular distal half and membranous proximal one (Fig. 30).

Length. Body: ♂ 25.5-31 mm, ♀ 21.5-27 mm; body with wings: ♂ 37-39 mm, ♀ 35-39 mm; pronotum ♂ 4.9-5.8 mm, ♀ 5.8-6.3 mm; tegmina ♂ 27.5-32.5, ♀ 28-31.5; hind femora ♂ 13-14.8 mm; ♀ 13.8-15 mm; ovipositor 22-24 mm.

Comparison. This species is similar to *D. annamita*, but differs in having the head and pronotum lighter, wings slightly shorter, basal part of hooks of the 9th abdominal tergite of male wider, 7th abdominal sternite of female without sclerotized or semimembranous tubercle, and ovipositor distinctly shorter.



Figs 7-12. *Diaphanogryllacris*. 7, 8, *D. albifrons* sp. n. (holotype); 9, 10, *D. propria* sp. n.; 11, 12, *D. pellucens* sp. n. (holotype). Head in front (7, 9, 11); head and pronotum from side (8, 10, 12).

***Diaphanogryllacris simulator* sp. n.**
(Figs 14, 22, 33)

Holotype. ♂, Vietnam, prov. Vinh Phu, Tam Dao, 800-900 m, primary forest, 1-11.VI.1995 (A. Gorochov).

Paratype. ♀, same data as holotype.

Description. Male (holotype). Very similar to *D. normalis* sp. n., but differs in the following characters: base of paired hook-like processes of 9th abdominal tergite distinctly narrower, paired hooks of 10th abdominal tergite and spine-like sclerite of genitalia slightly shorter (for comparison see Figs 13, 14, 21, 22).

Female. Similar to previous species, distinguished only by the presence of comparatively large, sclerotized, rounded, not pubescent tubercle at 7th abdominal sternite (Fig. 33).

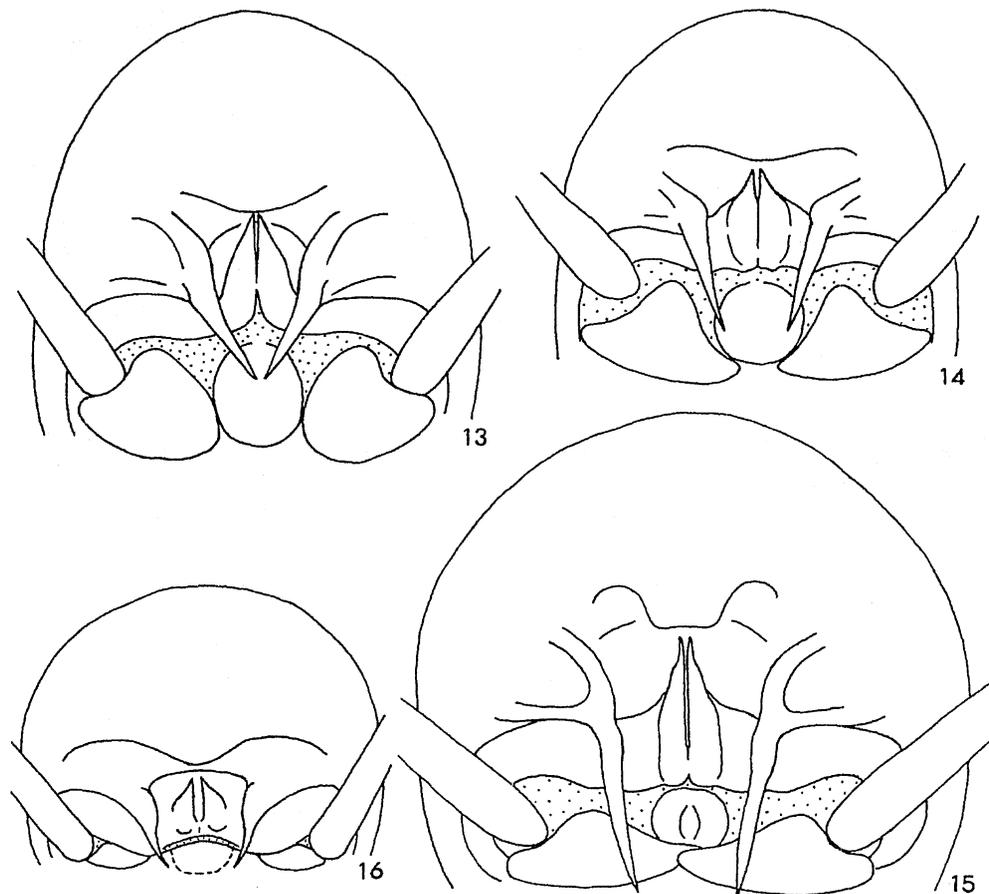
Comparison. The distinctions from *D. normalis* are given above. The new species is distinguished from *D. annamita* by the lighter head and pronotum, slightly shorter wings and distinctly shorter ovipositor.

Length. Body: ♂ 25 mm, ♀ 24.5 mm; body with wings: ♂ 36 mm, ♀ 35 mm; pronotum: ♂ 5.7 mm, ♀ 5.6 mm; tegmina: ♂ 27.5 mm, ♀ 29 mm; hind femora: ♂ 12 mm, ♀ 14 mm; ovipositor 22 mm.

***Diaphanogryllacris panfilovi* sp. n.**
(Figs 15, 23)

Holotype. ♂, China, prov. Yunnan, mouth of river Nandinhe, 5.VI.1956 (D. Panfilov).

Description. Male (holotype). Very similar to *D. normalis* and *D. simulator*, but wings longer (tegmina about 3 times as long as broad; their apices extending almost to apices of hind tibiae) and coloration of vertex lighter (hind part of vertex without any dark spots). Base of paired hook-like processes of 9th abdominal tergite as in *D. normalis*, but distal spine of these processes distinctly longer than in both previous species; paired hooks of 10th abdominal tergite similar to those of *D. normalis*, but longer; spine-like sclerite of genitalia slightly longer than in *D. normalis* and *D. simulator* (Figs 15, 23).



Figs 13-16. *Diaphanogryllacris*, apex of male abdomen from behind and slightly below. 13, *D. normalis* sp. n. (holotype); 14, *D. simulator* sp. n.; 15, *D. panfilovi* sp. n.; 16, *D. laeta* (Walk.).

Female unknown.

Length. Body 29.5 mm; body with wings 45.5 mm; pronotum 6.8 mm; tegmina 39.5 mm; hind femora 18 mm.

Comparison. The distinctions from *D. normalis* and *D. simulator* are given above. The new species differs from *D. annamita* in the lighter head and pronotum, slightly longer wings, and distinctly wider basal part of hooks of the 9th abdominal tergite of male.

***Diaphanogryllacris insignis* sp. n.**

(Fig. 32)

Holotype. ♀, Vietnam, prov. Nghetinh, 20-25 km W of Con Cuong, primary forest, 5-9.VI.1995 (N. Orlov).

Description. Female (holotype). Very similar to *D. normalis* sp. n. and *D. simulator* sp. n., but differs in the following characters: larger, ovipositor about 1.7 times as long as

hind femora, 7th abdominal sternite with very small, sclerotized, rounded, not pubescent tubercle at apex (Fig. 32).

Male unknown.

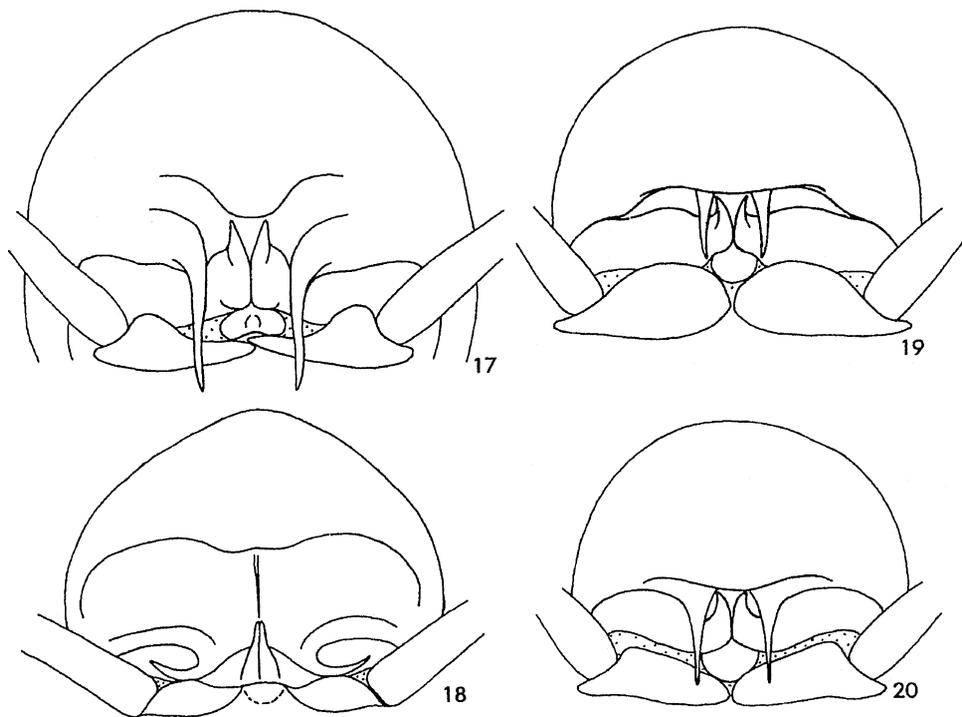
Length. Body 30.5 mm; body with wings 37 mm; pronotum 6.8 mm; tegmina 29 mm; hind femora 16.5 mm; ovipositor 28 mm.

Comparison. The distinctions from *D. normalis* and *D. simulator* are listed above. The new species differs from *D. panfilovi* in the distinctly shorter wings, and from *D. annamita* in the lighter head and pronotum, smaller and more sclerotized tubercle of the 7th abdominal sternite of female, and shorter ovipositor.

***Diaphanogryllacris laeta* (Walker, 1869)**

(Figs 3, 4, 16, 24, 25, 36, 41, 42)

= *Gryllacris chinensis* Brunner-Wattenwyl, 1888 (synonymized by Karny, 1937).



Figs 17-20. *Diaphanogryllacris*, apex of male abdomen from behind and slightly below. 17, *D. annamita* (Griff.); 18, *D. albifrons* sp. n. (holotype); 19, *D. translucens* (A.-Serv.); 20, *D. pellucens* sp. n.

Material. China, prov. Yunnan: 1 ♂, 1 ♀, mouth of river Nandinhe, 200 m, at light, 7-11.VI.1956 (Huang Ke-ren, D. Panfilov); 1 ♂, 30 km SW of Jinping, 370 m, at light, 15.IV.1956 (Huang Ke-ren); 1 ♂, 1 ♀, 10 km N of Kingtun, 1170-1200 m, 23-30.V.1956 (O. Kryzhanovskij); 2 ♀, Kingtun, at light, 22.V-1.VI.1956 (A. Zagulajev). Vietnam, prov. Son La: 1 ♂, 1 ♀, environs of Song Ma, 400-600 m, secondary forest, 13-14.V.1986 (A. Gorochov).

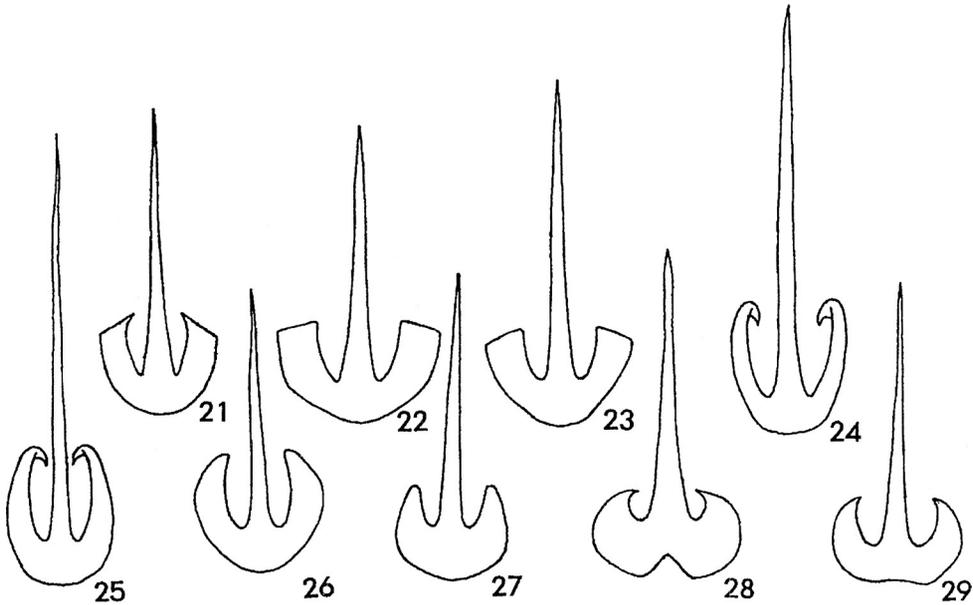
Note. This species was poorly described by Walker (1869) and Brunner-Wattenwyl (1888) from China. It is variable and requires a re-description.

Description. Male. Head with narrow black transverse band over eyes; this band twice or thrice interrupted in median part (sometimes hardly interrupted); hind part of vertex from light to black; dark vertical stripe along hind part of eyes and under them rather narrow and slight; labrum from light to dark (Figs 3, 4). Pronotum dark with rather wide light border along all edges or only along edges of fore half of pronotum and with more or less distinct light ornament in central part (Fig. 4). Femora without apical darkening; hind femora with black spines; tibiae light with brown spines (spines of fore and middle tibiae with light apices).

Wings elongated; their apices extending to apical parts of hind tibiae, transparent; most of veins yellow or light brown, but several veins brown or dark brown. Base of paired hook-like processes of 9th abdominal tergite narrow; distal spine of these processes comparatively short (Fig. 16); median part of this tergite with 1 or 2 very small denticles directed downwards (to hooks of 10th abdominal tergite) (Figs 41, 42); spine-like sclerite of genitalia very long (Figs 24, 25).

Female. Similar to male in general appearance. Ovipositor about 1.3-1.5 times as long as hind femora; 7th abdominal sternite rather large and not membranous, with notch at hind edge; genital plate with slightly notched apical part (specimen from Nandinhe with rather deeply notched apical part of this plate) and membranous proximal half (Fig. 36, 37).

Length. Body: ♂ 20-24 mm, ♀ 23-35 mm; body with wings: ♂ 37.5-43 mm, ♀ 37.5-44 mm; pronotum: ♂ 4.4-5.8 mm, ♀ 5.5-6.1 mm; tegmina: ♂ 31.5-35 mm, ♀ 31-35 mm; hind femora: ♂ 12-15 mm, ♀ 13.5-16.5 mm; ovipositor 19.5-24.5 mm.



Figs 21-29. *Diaphanogryllacris*, spine-like sclerite of male genitalia. 21, *D. normalis* sp. n. (holotype); 22, *D. simulator* sp. n.; 23, *D. panfilovi* sp. n.; 24, 25, *D. laeta* (Walk.) (24, China; 25, Vietnam); 26, *D. annamita* (Griff.); 27, *D. albifrons* (holotype); 28, *D. translucens* (A.-Serv.); 29, *D. pellucens* sp. n.

***Diaphanogryllacris annamita* (Griffini, 1909), stat. n.**

(Figs 5, 6, 17, 26, 31)

= *Gryllacris laeta* var. *annamita* Griffini, 1909.

Material. Vietnam, prov. Gia Lai, 20 km N of Kannack, Buon Luoi, primary forest: 1 ♀, VII.1983 (I. Darevskij); 13 ♂, 6 ♀, 24.III-10.V.1995 (A. Gorochov).

Note. This species was described by Griffini (1909) from the central part of Vietnam as a variety of *D. laeta*, but they clearly differ in the coloration and structure of copulative complex and must be considered as two distinct species.

Description. Male. Head with wide black transverse band over eyes; hind part of vertex black or brown; dark vertical stripe along hind part of eyes and under them wide; labrum and mandibles light (Figs 5, 6). Pronotum dark with rather wide light border along edges of hind half of pronotum and with almost indistinct lightish ornament in central part (Fig. 6). Legs—as in *D. laeta*. Wings rather long; their apices extending almost to apices of hind tibiae; most of veins yellow, but several veins light brown. Base of paired hook-like processes of 9th abdominal tergite narrow; distal spine of these pro-

cesses long (Fig. 17); spine-like sclerite of genitalia as in Fig. 26.

Female. Similar to male in general appearance. Ovipositor long, about 2.1 times as long as hind femora; 7th abdominal sternite rather small and semimembranous, separated from 6th abdominal sternite by rather wide membranous area, and with comparatively large, semimembranous, rounded, pubescent tubercle; genital plate with membranous proximal and triangular distal halves (Fig. 31).

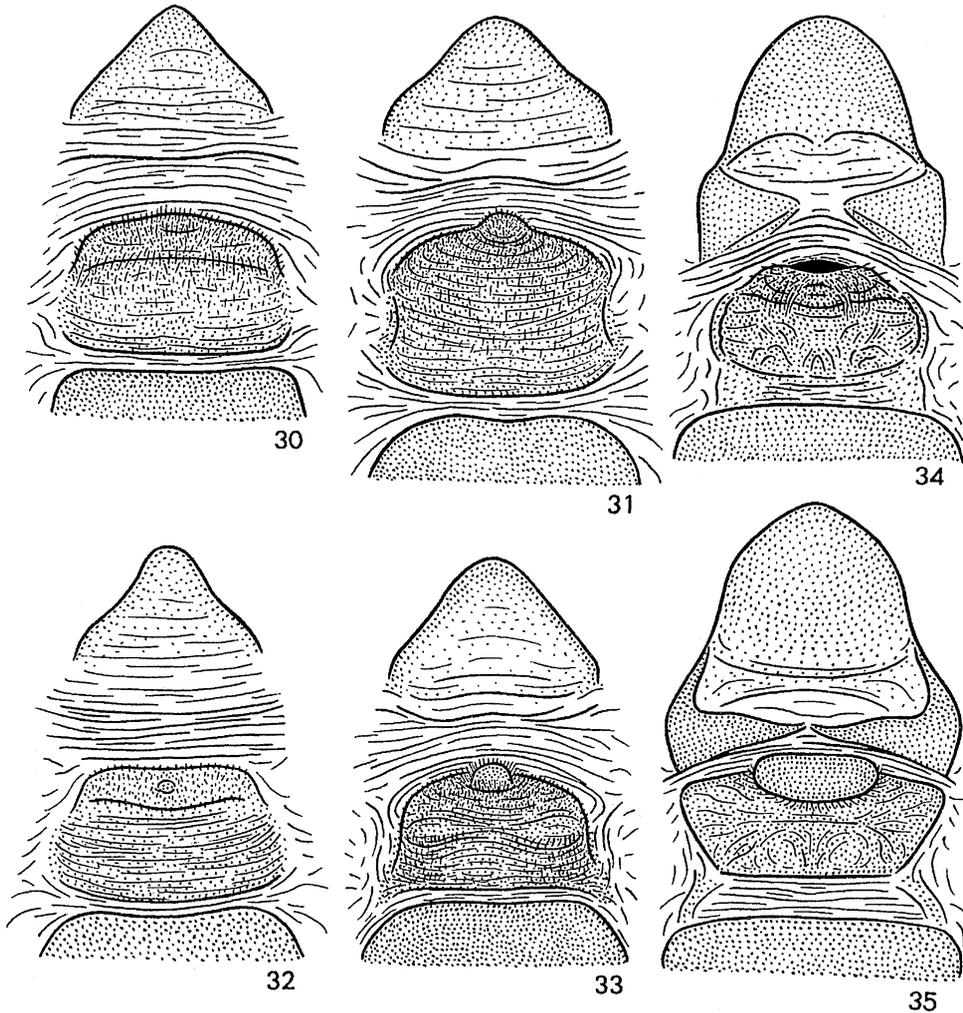
Length. Body: ♂ 21-32 mm, ♀ 23-34 mm; body with wings ♂ 39-45 mm ♀ 36-42 mm; pronotum ♂ 5.7-6.1 mm, ♀ 5.5-6.2 mm; tegmina ♂ 31.3-36.6 mm, ♀ 29.2-33.7 mm; hind femora ♂ 13.6-17.1 mm, ♀ 13.6-15.2 mm; ovipositor 29.5-33.2 mm.

***Diaphanogryllacris propria* sp. n.**

(Figs 9, 10, 38)

Holotype. ♀, Vietnam, prov. Gia Lai, environs of Kannack, secondary forest, 8-16.XI.1988 (A. Gorochov).

Description. Female (holotype). Head light with 2 pairs of stripes: transverse over eyes (from eyes to hind part of head) and vertical under eyes (Figs 9, 10). Pronotum dark with rather wide light border along edges of hind



Figs 30-35. *Diaphanogryllacris*, genital plate, 7th and apex of 6th abdominal sternites of female from below. 30, *D. normalis* sp. n.; 31, *D. annamita* (Griff.); 32, *D. insignis* sp. n.; 33, *D. simulator* sp. n.; 34, *D. translucens* (A.-Serv.); 35, *D. pellucens* sp. n.

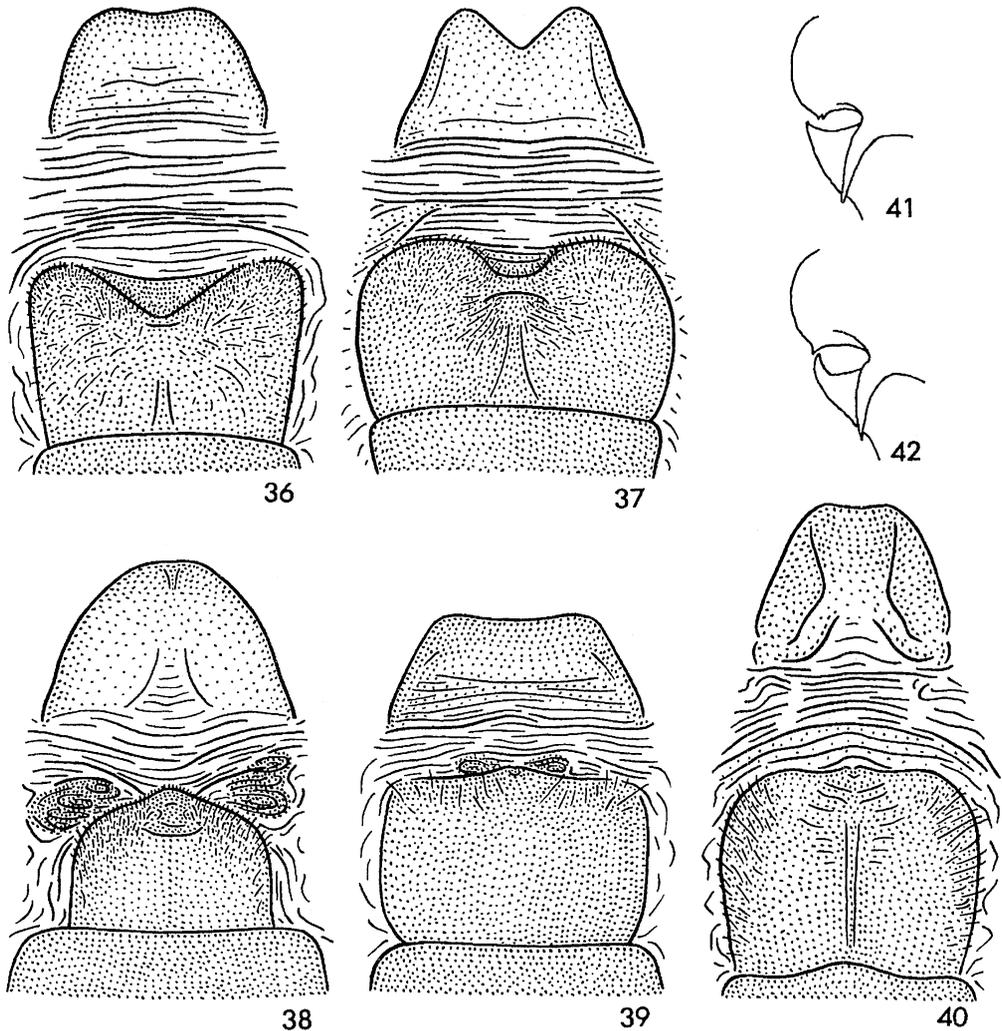
half of pronotum and with almost indistinct lightish ornament in central part (Fig. 10). Femora without apical darkening; tibiae light with black spines and black middle part of hind tibiae (spines at light parts of hind tibiae also light). Wings short; tegmina 1.4 times as long as pronotum and head combined; veins brown. Ovipositor long, about 1.45 times as long as hind femora; 7th abdominal sternite comparatively small and not membranous, with narrowly rounded hind edge (membranous area near this edge with a pair of rather small blackish sclerotizations); genital plate with membranous

proximal and rounded distal halves (Fig. 38).

Male unknown.

Length. Body 29 mm; pronotum 5.6 mm; tegmina 10.5 mm; hind femora 15 mm; ovipositor 22 mm.

Comparison. *D. propria* differs from all species of this genus in the very short wings. It is related to *D. aequalis*, but distinguished by the absence of darkenings on fore and middle tibiae, median part of head, and hind part of vertex, by the size of 7th abdominal sternite of female and shape of its genital plate (for comparison see Figs 38, 39).



Figs 36-42. *Diaphanogryllacris*. 36, 37, *D. laeta* (Walk.) (36, Kingtun; 37, Nandinhe); 38, *D. propria* sp. n.; 39, *D. aequalis* (Walk.); 40, *D. albifrons* sp. n.; 41-42, *D. laeta* (41, Son La; 42, Nandinhe). Genital plate, 7th and apex of 6th abdominal sternites of female from below (36-40); apical parts of 9th and 10th tergites of male from side (41, 42).

***Diaphanogryllacris albifrons* sp. n.**
(Figs 7, 8, 18, 27, 40)

Holotype. ♂, Vietnam, prov. Gia Lai, 20 km N of Kannack, Buon Luoi, primary forest, 25.IV.1995 (A. Gorochov).

Paratypes. Vietnam, prov. Gia Lai: 1 ♀, same data as holotype; 1 ♂, 40 km N of Kannack, Tram Lap, primary forest, 20-24.IV.1995 (A. Gorochov).

Description. Male (holotype). Coloration of head and pronotum similar to that of *D. propria*, but dark part of pronotum with

large lightish spots (Figs 7, 8). Femora without apical darkening; fore and hind femora with a pair of dark lower carinae; hind femora with black spines at these carinae; tibiae reddish; fore and middle tibiae with black spines (apices of these spines light); hind tibiae with almost light spines along upper edges. Wings long, their apices extending to apices of hind tibiae; veins black. Paired hook-like processes of 9th abdominal tergite very characteristic – strongly arched and directed laterally; paired hooks of 10th ab-

dominal tergite rather narrow and short (Fig. 18); spine-like sclerite of genitalia as in Fig. 27.

Variation. Paratype slightly darker, but its pronotum distinctly darker (dark part of pronotum with small lightish spots only) (Figs 7, 8).

Female. Similar to male in general appearance. Ovipositor long, about 1.5 times as long as hind femora; 7th abdominal sternite normal (large, not membranous, without special tubercle; additional sclerotizations of membranous areas near hind edge of this sternite absent); genital plate with membranous proximal half and slightly notched apical part (Fig. 40).

Length: body ♂ 23-25 mm, ♀ 26 mm; body with wings ♂ 42-43 mm, ♀ 46 mm; pronotum ♂ 4.9-5.1 mm, ♀ 6.1 mm; tegmina ♂ 34-34.5 mm, ♀ 37 mm; hind femora ♂ 14.2-15 mm, ♀ 16.9 mm; ovipositor 26.3 mm.

Comparison. *D. albifrons* differs from all species of this genus in the coloration of femora, tibiae, and veins, shape of processes of male abdominal tergites, and characteristics of female abdominal apex.

***Diaphanogryllacris pellucens* sp. n.**
(Figs 11, 12, 20, 29, 35)

Holotype. ♀, Thailand, prov. Krabi (central Malacca), environs of Ao Nang, hill near sea, secondary forest, 17-19.VII.1996 (A. Gorochov).

Paratype. ♂, Thailand, prov. Ranong, environs of Pakchon, at light, 26.XII.1997 (V. Grigorenko).

Description. Female (holotype). Head light brown, with almost indistinct, brownish, wide transverse band over eyes and rather narrow vertical stripes along hind part of eyes and under them (Figs 11, 12). Pronotum brownish with almost indistinct lightish ornament in central part (Fig. 12). Femora without apical darkening; hind femora with black spines; tibiae light with brown spines of fore and middle legs and black spines along upper edges of hind tibiae. Wings rather long; their apices almost extending to apices of hind tibiae; veins dark brown. Ovipositor rather short, about 1.3 times as long as hind femora; 7th abdominal sternite rather small, not membranous, separated from 6th sternite by rather wide membranous area; hind part of this sternite with a large, transverse, not pubescent process (Fig. 35); genital plate as in Fig. 35, with partly

membranous proximal half provided with transverse fold.

Male. Similar to female in general appearance, but veins of wings brownish yellow. Distal spine of paired hook-like processes of 9th abdominal tergite thin; paired hooks of 10th abdominal tergite short (Fig. 20); genitalia with spine-like sclerite as in Fig. 29 and semimembranous area near base of this sclerite.

Length: body ♂ 24 mm, ♀ 27 mm; body with wings ♂ 41 mm, ♀ 43 mm; pronotum ♂ 5.8, ♀ 6.1 mm; tegmina ♂ 33.9 mm, ♀ 35.1 mm; hind femora ♂ 16 mm, ♀ 16.1 mm; ovipositor 21 mm.

Comparison. The new species is similar to *D. translucens* and *D. tibialis* in the structure of the abdominal apex and genitalia of male (see Figs 19, 20, 28, 29), but differs in the short ovipositor (in *D. translucens* it is 1.45-1.5 times and in *D. tibialis* 1.57 times as long as hind femur) and characteristics of the 7th abdominal sternite of female (in *D. translucens* and *D. tibialis*, it is with semimembranous, pubescent, transverse, fold-like lobe at hind part; see Fig. 34). The new species differs from *D. tibialis* also in the light hind tibiae (in *D. tibialis*, basal part of hind tibiae black).

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