The genus *Hilethera* Uv. and its species
(Orth. Acrid.)

BY

B. P. UVAROV

London.

The genus *Hilethera* has been founded by me in 1923 [1] to include a very peculiar new grasshopper from Palestine named *H. hierichonica* Uv. To the same genus I have referred at the time an Arabian species described by me the year before as *Lerina aeolopoides* Uv. and at present I have before me two more new species, one from Turkestan, another from Sudan which also belong to *Hilethera*. Since I am inclined now to include in *Hilethera* also *Lerina buxtoni* Uv. which in 1923 I thought to fit better into *Aiolopus*, the genus *Hilethera* consists of five well defined species, and I feel bound to present some remarks on the characteres and relationship of the genus and its species, as well as to give a key to species.

The systematic position of *Hilethera* is somewhat indefinite, since it belongs to the group of genera linking together the subfamilies (or even families of most older authors) *Acridinae*, or *Truxalinae*, and *Oedipodinae*. Indeed, the resemblance of certain species of *Hilethera* to those of *Aiolopus* (= *Epacromia*) is very great, and it caused me to hesitate before referring them to *Hilethera;* on the other hand, *Hilethera* is both similar and related to *Encoptolophus* and *Lerina* which are both true members of *Oedipodinae*.

The characters which separate *Hilethera* from *Aiolopus* have been briefly indicated by me when describing the genus, but some of them are not common to all species included in the genus now. The most important feature of *Hilethera* is the peculiar venation of elytra, specially in the male sex, in which the interulnar area is either very much,

[1] *Entom. Monthly Magaz.*, 3rd ser., IX, p. 82.

or at least distinctly, broader than the discoidal area, and has no regular false vein always present in *Aiolopus*. In the female sex, however, the interulnar area is scarcely broader than it is usual in *Aiolopus*, and, in some species, it is provided with a distinct false vein. The highly peculiar serrulation of the discoidad vein, as described for *H. hierichonica*, cannot be considered a generic character since it is not so well, or not at all, expressed in other species. As regards the venation of the hind wings, that of the genotype, *H. hierichonica*, in which the hind branch of the radial vein is closely approximated to the anterior ulnar vein is equally characteristic of all other species, in both sexes, except *H. sudanica*, which is somewhat aberrant in other respects, as well.

The head of *Hilethera* differs from that of *Aiolopus* only by somewhat more distinctly sloping vertex and by the temporal foveolae being distinctly triangular; this latter character occurs in one species of *Aiolopus* only, namely in *A. tergestinus* Mühl. differing from *Hilethera* in many characters. The eyes of *Hilethera* are more round than in *Aiolopus*, that is they approach the type of eyes of *Oedipodinae*. The somewhat peculiar structure of antennae of *H. hierichonica* is not a generic character but varies specifically.

There are some good, if somewhat subtle, differences between *Hilethera* and *Aiolopus* in the structure of pronotum. Thus, the median keel is in *Hilethera* generally more raised than in *Aiolopus;* it is best developed in *H. sudanica* and least in *H. buxtoni;* in the latter species, however, the venation of elytra or the male leaves no doubt as to the species being a *Hilethera*. The lateral keels of pronotum are wholly absent in *Aiolopus* in which the lateral lobes of pronotum do not even form angles with its disc; in *Hilethera*, at least, the angles are perceptible when there are no keels (in *H. buxtoni*), or the keels are distinct, if only on the prozona. Hind margin of the pronotal disc in *Hilethera* is not always as sharply angulated as it is in the genotype, but it is always more or less distinctly angulate, never broadly rounded as in *Aiolopus*.

Hind femora in all species of *Hilethera* are distinctly shorter and broader than even in the *strepens*-group of *Aiolopus*, and this is a good generic character. Hind tibiae in *Hilethera* are also unusually short and thick.

With regard to the type of coloration, the striking black and white pattern of the inner side of hind femora and of hind tibiae is very characteristic for *Hilethera*, while the presence of blue, or red colours, and the absence of heavy black annulation is typical for *Aiolopus*. The highly developed black and white pattern of elytra in certain species of *Hilethera* may entirely disappear in others *(buxtoni)*, but when present, it gives the insect a very distinctive appearance. The infumate band of the hind wings is also developed not in all species of *Hilethera*.

The above observations make it clear that the genera *Hilethera* and *Aiolopus* are closely related. This would seem to indicate that *Hilethera* belongs to *Acridinae*, but a comparison of *Hilethera* with some genera of *Oedipodinae* shows that its relationships in that direction are also very strong.

Apparently the nearest relative of *Hilethera* amongst *Oedipodinae*, is the genus *Encoptolophus*, occuring in the southern United States and in Mexico. *Hilethera* differs from *Encoptolophus* in the venation of elytra, in the less sloping fastigium of vertex, in the not (or scarcely) sulcate frontal ridge, in the more elongate temporal foveolae, and in the pattern of the hind legs. All these characters are of relative value only and no doubt can arise as to *Hilethera* and *Encoptolophus* being members of the same group of genera, not of two different subfamilies.

The genus *Lerina* Bol. is also very closely allied to both *Hilethera* and *Encoptolophus*, sharing with the latter the venation of elytra (except for the position of the discoidal vein) and structure of the head, while the shape of hind femora and tibiae and their pattern are of the *Hilethera*-type. Pronotum in *Lerina* is quite typical for *Oedipodinae*, distinctly saddle-shaped and very broadly rounded behind.

Finally, there is, I believe, not mere similarity but a genuine, if not close, relationship between *Hilethera* and *Trilophidia*, certain characters of the aberrant *H. sudanica* indicating the possible direction of the connection.

Thus, the characters of the genus *Hilethera* and some other allied to it emphasize strongly the impossibility of drawing a definite demarkation line between the, so called, subfamilies *Acridinae* and *Oedipodinae* which fuse into each other quite imperceptibly. The two

groups may be kept separate for purely practical purposes of identification, trough this leads to many difficulties for a beginner, but their separation has no true scientific meaning, beyond showing that they represent two gradually divergent (and partly confluent) lines of evolution.

The geographical distribution of *Hilethera*, *Encoptolophus* and *Lerina* raises the problem of relationship between the faunas of the dry desert belt of the Old World and the corresponding zone of America. I am not going to enter here into a discussion of this problem which would require a careful study of many facts, but I think that attention of students of Orthoptera, in particular, must be turned on to a closer study of interrelations of the two faunas, and no descriptions, or revisions of genera belonging to one of them should be undertaken without carefully studying the genera of another fauna.

Key to species of *Hilethera*.

1 (4). Hind tibiae black with one narrow white ring near the base (fig. 4). Interulnar area of elytra in ♂ more than twice as broad as the discoidal area (figs. 1, 5). Elytra of both sexes with very sharply defined large black spots and pure white fasciae. Wings with an infumate preapical fascia. Sides of abdomen partly black.

2 (3). Smaller. Antennae (♂) scarcely extending beyond the prozona, distinctly incrassate (fig. 2). Pronotum more rugose. Anterior ulnar vein of ♂ elytra straight and forming an obtuse angle with the straight hind furcal branch (fig. 1).—Palestine... ..... 1. **hierichonica.**

3 (2). Larger. Antennae reaching the hind margin of pronotum or longer. Pronotum less rugose. Anterior ulnar vein of ♂ elytra sinuate and forming a bow, or a broadly rounded angle, with the also sinuate furcal branch (fig. 5).—Arabia, Punjab..... 2. **aeolopoides.**

4 (1). Hind tibiae with alternating, equally broad, white and black rings (figures 10, 14, 18).—Interulnar area of elytra in ♂ less than twice as broad as the discoidal area (figs. 8, 11, 17). Elytra of both sexes pale ochraceous with irregularly defined brown fasciae, sometimes split into small spots, or obliterated. Wings hyaline, or with only the very apex slightly infumate. Abdomen unicolorous.

5 (8). Median area of the hind wings very narrow, enclosed between the distinctly dilated interradial and interulnar areas (as in fig. 1). Frontal ridge flat, its margins not raised. Wings not infumate apically. General habitus very like *Aiolopus*.

6 (7). Inner side of hind femora with two white fasciae in the apical half (fig. 9). Interulnar area of ♂ elytra nearly twice as broad as the discoidal area (fig. 8).—Mesopotamia ..... 3. **buxtoni.**

7 (6). Inner side of hind femora with only a white pre-apical fascia (fig. 13). Interulnar area of ♂ elytra about half again as broad as the discoidal area (fig. 11).—Turkestan ..... 4. **turanica,** sp. n.

8 (5). Median area of the hind wings as broad as the interradial and interulnar areas (fig. 17). Frontal ridge somewhat impressed, its margins raised. Wings with the very apex infumate. General habitus like *Trilophidia.*—Sudan ..... 5. **sudanica,** sp. n.

1. **Hilethera hierichonica** Uv. (Plate I, figs. 1-4).

1923. *Hilethera hierichonica,* Uvarov, Entom. Monthly Magaz., 3rd ser., IX, p. 83, fig. 1.

The type from Jericho still remains the only specimen known.

2. **Hilethera aeolopoides** Uv. (Plate I, figs. 5, 6).

1922. *Lerina aeolopoides,* Uvarov, Journ. Bombay Nat. Hist. Soc., XXVIII, p. 359.

1923. *Hilethera aeolopoides,* Uvarov, Entom. Monthly Magaz., 3rd ser., IX, p. 84.

I have described the species after a single male from Muscat, Arabia; now I have before me a series of 11 ♂♂ and 9 ♀♀ from Lyallpur, Punjab (collected by M. Afzal-Hussain, T. Bainbrigge Fletcher, D. Nath a. o.), and 1 ♀ from Tatta, Sind (Ch. McCann).

The Punjab series exhibits a great constancy of the pattern characteristic for the species, but it differs slightly from the type. Thus, the hind angle of pronotum is quite acute in the type, while in the Punjab specimens the immediate angle is distinctly rounded; anterior ulnar vein of ♂ elytra forms a rounded angle with the furcal branch in the Punjab specimens, not a broad bow, as in the type; infumated fascia of hind wings is in the type only narrowed in front of the anal vein, while in the Punjab series it is clearly interrupted there. It is not possible for me to establish the taxonomic value of these differences, as I have seen from Arabia the type only, and I cannot be certain that

the characters are common to all Arabian specimens, in which case the Punjab form might be separated as a subspecies.

3. **Hilethera buxtoni** Uv. (Plate II, figs. 7, 10).

1922. *Lerina buxtoni,* Uvarov, Journ. Bombay Nat. Hist. Soc., XXVIII, p. 360.

This, and the next, species are very like *Aiolopus* in the general appearance. In the male sex they are, of course, recognisable by the venation of elytra, while the females may be most easily separated from *Aeolopus* by the narrow median field of wings, which is, however, not as narrow, as in the two preceding species of *Hilethera*.

In the venation of elytra of the male, *H. buxtoni* still approximates the genotype and *H. aeolopoides* though the interulnar field is relatively more narrow than in those species. The pattern of elytra, when not altogether obliterate (see description of paratype, *l. c.)* is of the type of a *Sphingonotus*. The coloration of the inner side of hind femora where there are two white fasciae (postmedian and preapical) is very characteristic for *H. buxtoni*.

Apart from the two original male specimens from Amara, I have before me now a female from the same locality (VI. 1917, C. F. C. Beeson), and 2 ♂♂ from Baghdad (R. W. G. Hingston).

4. **Hilethera turanica,** sp. n. (Plate II, figs. 11-14).

♂. Very similar in general appearance to *Aiolopus strepens* Latr. in its typical form.

Antennae distinctly incrassate, with the apex abruptly truncate, short, extending to about the middle of metazona. Frontal ridge flat, with a few subobliterate minute punctures, somewhat narrowed at the fastigium, subparallel in the rest, with a faint constriction near the ocellum. Fastigium of vertex pentagonal, distinctly longer than broad, with the apex truncate. Foveolae elongate-triangular, with sharp, raised margins, the lower margin slightly incurved. Pronotum distinctly laterally compressed, but scarcely constricted in prozona (very similar in shape to the pronotum of *Aiolopus strepens strepens);*

disc very feebly tectiform; median keel low, but quite distinct, interrupted by the hind sulcus and subinterrupted by the first sulcus; lateral keels indicated each by a series of low tubercles between the sulci, convergent in front, fairly well distinct in metazona, though obliterate behind; transverse sulci deep; anterior margin slightly convex, with a distinct submarginal sulcus; hind angle about 90°, broadly rounded. Elytra reaching the middle of hind tibiae; discoidal vein sinuate, apically approximated to the hind radial vein but not touching it, incrassate; interulnar area only about half again as broad as the discoidal area; anterior ulnar vein forming a very broad bow with the furcal branch; this vein and all veins of the furca incrassate. Wings more elongate than in the genotype; median area narrow, but less so than in the genotype.

Coloration brown. Antennae blackened in the apical half and with some irregular blackish rings basally. Elytra hyalinous; basal fourth, an irregular spot about the middle, extending from the anterior margin to the middle of interulnar area and fading posteriorly, and three small spots between the radial veins near the apex, brown; a few very pale brown small spots scattered in the apical third. Wings very faintly greenish at the base; veins in the apical part brown, but the membrane perfectly hyalinous. Hind femora externally with two scarcely perceptible dark fasciae; the inner area and the lower inner sulcus black except for a pale preapical ring. Hind tibiae dirty-whitish, with the base, a pre-median and a preapical ring, black.

♀. Fastigium of vertex distinctly, but not much, longer than broad. Median keel of pronotum distinctly cut by the first sulcus. Interulnar area of elytra only a little broader than the discoidal area, with an irregular false vein. Coloration as in the male.

Total length ♂ 17.5, ♀ 23; pronotum ♂ 3.5, ♀ 4.5; elytra ♂ 17, ♀ 20; hind femur ♂ 9.5, ♀ 11 mm.

The male type and a female paratype are from the Zaaminskaya volost, dist. Dzhizak, Turkestan, 15. IV. 1912 (sent by the Turkestan Entomological Station; the type will be deposited in the Zoological Museum of the Academy of Sciences, Petrograd); another female paratype is from Skobelevo, Turkestan, 12. IV. 1920 (sent by the same Station).

This species can be easily separated from others by the characters

indicated in the key; from *Aiolopus strepens* with which it may be confused, if superficially examined it differs at once by the coloration of hind legs, apart from the morphological characters.

5. **Hilethera sudanica,** sp. n. (Plate III, figs. 15-18).

♂. Similar in the general appearance to *Trilophidia.*

Antennae quite distinctly incrassate in the apical half, practically reaching the hind margin of metazona. Frontal ridge punctured, flat, slightly impressed at the ocellum, distinctly constricted at the fastigium and below the ocellum; margins not raised, but sharp. Fastigium of vertex narrow pyriform, open apically. Foveolae elongate-triangular, impressed; lower margin straight. Occiput rugulose. Pronotum distinctly rugulose; median keel in prozona well raised, convex in profile, subinterrupted by the first sulcus; linear in metazona; lateral keels in the shape of sharp short ridges in front of the first sulcus, and only indicated in metazona; transverse sulci deep; anterior margin distinctly convex; hind angle a little more than 90°, broadly rounded. Elytra extending beyond the middle of hind tibiae; discoidal vein incrassate, sinuate and apically touching the hind radial vein interulnar area about half again as broad as the discoidal area, with an irregular false vein; anterior ulnar vein forming a broad bow with the furcal branch; this vein and all veins of the furca slightly incrassate; Wings moderately elongate; median area as broad as the two areas between which it is enclosed.

Coloration reddish-brown. Antennae with irregular dark rings. Occiput and pronotum with black dots. Elytra subhyalinous; basal fourth, a fascia in the middle and nearly the whole apical third, brown, but the pattern consists of confluent small spots with pale interspaces; the apical brown part is paler than others and with larger hyalinous interspaces. Wings faintly yellowish at the very base; apex faintly infumate; veins brown. Hind femora above with a spot at the base and two fasciae, pitch-black; the fasciae are represented on the externo-median area by black dots; inner side black with two pale fasciae; inner lower sulcus black with a pre-apical pale fascia. Hind tibiae black, with two broad white fasciae.

♀. Discoidal vein only slightly approximated apically to the hind radial vein; interulnar area scarcely broader than the discoidal area, with a distinct false vein.

Total length ♂ 16, ♀ 19; pronotum ♂ 3.5, ♀ 4; elytra ♂ 16, ♀ 18.5; hind femur ♂ 9.5, ♀ 10 mm.

The type ♂ and 13 paratypes are from Khartoum, Sudan, 13. x. 1920 (H. H. King.).

This is a somewhat aberrant member of the genus, since it disagrees with other species in the venation of hind wings, in the shape of fastigium and in the more rugose sculpture of head and pronotum. However, the venation of elytra of the male is of the same type as in other species of the genus and anyhow *Hilethera* is the only genus into which it may be included at present while I feel it inadvisable to describe a new genus on such insufficient characters.

In the general appearance *H. sudanica* is the most Oedipodine-like of all species and reminds one strongly on *Trilophidia*, but, of course, differs from it in the venation of elytra, structure of fastigium and foveolae, and, particularly, in the structure of pronotum.

* * *

In conclusion, I wish to express my most sincere thanks to my friend Dr. Candido Bolivar and to the authorities of the Museo Nacional de Ciencias Naturales, Madrid, for their generosity which permitted me to get this paper fully illustrated. I am very much obliged also to the editor of the «Entomologist's Monthly Magazine» for the permission to reproduce figures of *Hilethera hierichonica* (Plate I, figures 1, 2 and 4).

Explanation of the plates.

PLATE I.

Fig. 1, 2. Hilethera hierichonica, Uv., ♂, type × 6.
— 3. — — — — × 8.
— 4. — — — — × 6.
— 5. — aeolopoides, Uv. ♂, type × 5.
— 6. — — — — × 8.

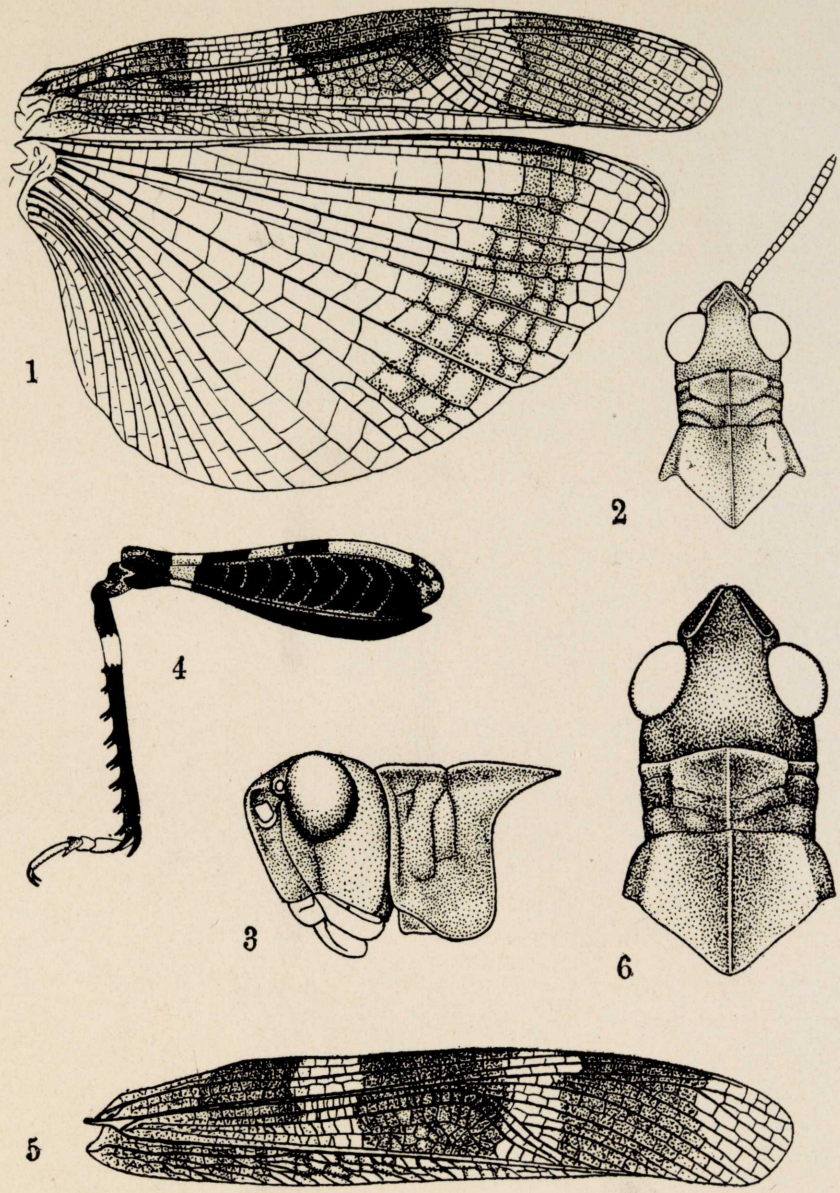
PLATE II.

Fig. 7. Hilethera buxtoni, Uv., ♂, type × 7.
— 8. — — — — × 5.
— 9, 10. — — — — × 6.
Fig. 11. Hilethera turanica, sp. n., ♂, type × 5.
— 12. — — — — × 6.
— 13, 14. — — — — × 6.

PLATE III.

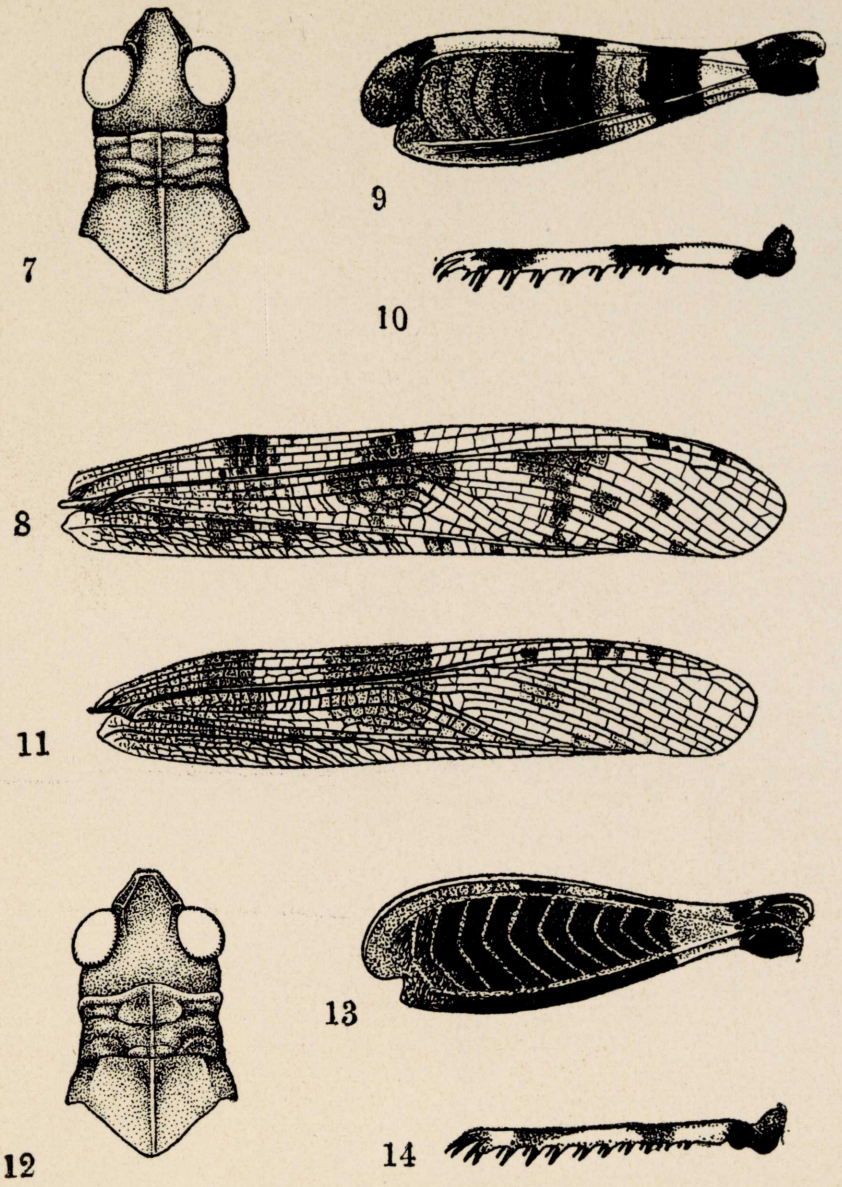
Fig. 15, 16. Hilethera sudanica, sp. n., ♂, type × 6.
— 17. — — — — × 5.
— 18. — — — — × 6.

Note.—Markings on the elytra, especially in the figures 1 and 5, are shown much paler than they actually are, in order not to obscure the venation.

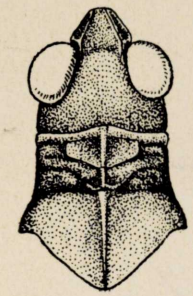


B. Jobling, del.

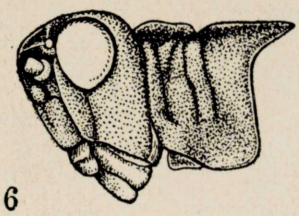
Figs. 1-4. *Hilethera hierichonica* Uv.—Figs. 5-6. *H. aeolopoides* Uv.



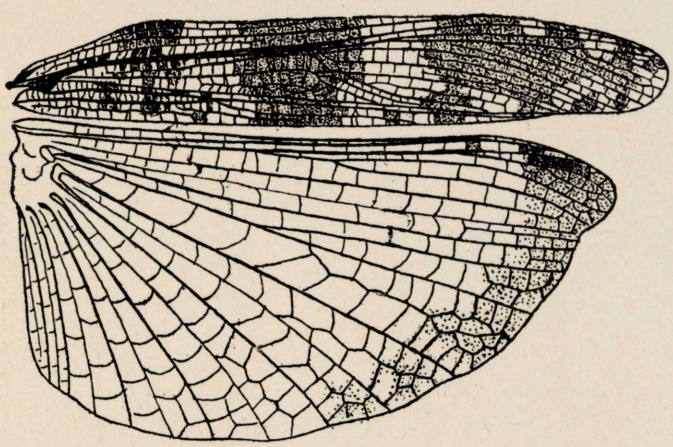
Figs. 7-10. *Hilethera buxtoni* Uv.—Figs. 11-14. *H. turanica* Uv.



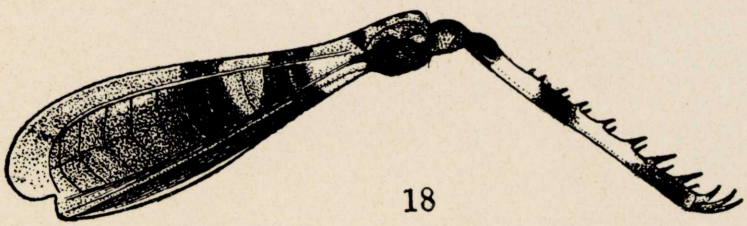
15



16



17



18

B. Jobling, del.

Figs. 15-18. *Hilethera sudanica* Uv.