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TWO NEW SPECIES OF THE GENUS CHORTHIPPUS (ACRIDINAE) FROM ISRAEL*

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Introduction

The genus Chorthippus was until recently represented in Israel by one endemic form. Ch. dorsatus palaestinus Uv., being one of the rare alpine intro- ductions in the generally eremic acridofauna of this region (Buxton and Uvarov, 1924; Bodenheimer, 1935). The two additional species described here were col- lected during June-July, 1967 on Mount Hermon in the Golan region, Northern Israel.

Chorthippus dirshi sp.n. (Plate I, Figures 1 to 12)

MALE (Fig. 1): Antennae: As long as head and pronotum together, segments flattened, punctate, the fourth one shorter than wide; the others longer (Fig. 5). The distal segments as long as broad, densely punctate with short hairs.

Head (Fig. 7): Occiput somewhat swollen, broader than the pronotum and as long as the pronotum; face oblique, frontal ridge sparsely punctate, extending from the antennal bases downwards. Vertigal fastigum somewhat oblique, pentagonal, with raised anterior margins.

Faveolae well seen from above, twice as long as broad, straight; moderately concave with rounded margins. Eyes 11/4 times longer than the subocular groove.

Pronotum moderate teetiform: front margin rounded, hind margin with an obtuse angle (Fig. 9). Median keel prominent, cut by the second transversal sulcus behind the middle; lateral carinae distinct, granulated in the metazona,

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* I am glad to dedicate this paper to my former teacher and dear colleague Prof. H. Bytinski-Salz in occasion of his 65th birthday.

converging towards the first sulcus. Elytra rudimentary, twice as long as wide, reaching the fourth abdominal tergum, apex rounded (Fig. 3); median field widened, maximal width approximately twice that of the remaining anterior tegminal field; with a false vein and irregular veinlets. The distal part of the scapular field has regular oblique veinlets. Hind wings shorter than elytra, membranaceous. Tympanal organ with a rounded-elliptical opening.

Mesosternal space broader than the mesosternal lobes (Fig. 11). The space between the metasternal lobes is quadrate. Subgenital plate swollen, short. Cerci granulated, sharp with long hairs; 1 1/2 as long as wide. Hind femora three times as long as their maximal width. Hind tibia with 13 spines on the outer line and 10 on the inner; spurs strong, the inner one is 3/4 as long as the first tarsal segment. Empodia small, maximally 1/2 as long as the claws.

Coloration dark brown, with black lines on head, pronotum and uncovered parts of the abdominal terga. The inner side of hind femora light yellowish; hind tibia gray.

FEMALE (Fig. 2): Antennae shorter than head and pronotum together, sparsely covered with hair; proximal segments flat, distally rounded, most of them longer than wide (Fig. 6). Frontal ridge punctate; shallowly sulcate around the ocellus, without clear margins. Fastigum broader than long, with median keel dividing it into two parts and extending posteriorly (Fig. 8). Eyes as long as the subocular groove.

Pronotum with two well-developed transversal sulci, the posterior one curved cephad and crossing the median keel behind the middle (Fig. 10); the anterior sulcus not crossing the keel, divides the prozona into a wider anterior and a smaller posterior part. Lateral lobes of pronotum higher than long, anteriorly rounded, posteriorly with a blunt angle.

Elytra rudimentary, less than twice as long as wide (Fig. 4); the tip reaching to the middle of the second abdominal tergite. Radial and costal veins bent, with oblique veinlets in between. Median field somewhat widened, the greatest width being less than that of the costal field. Hind wings shorter than the elytra. Ovipositors valvae short, stout, with enlarged base.

Coloration: brown, with a pattern of black spots and pale areas on the dorsal part of head and pronotum, that extends also on the abdomen; lateral parts of abdomen blackish. Hind femur with black spots on the outer side and a black basal line on the inner side.

<u>Dimensions</u>:	Body length:	male 12.5 mm;	female 26.5 mm	
	Elytra :	" 4.5 mm;	" 3 mm	
	Pronotum :	" 3 mm;	" 4 mm	
	Hind femur :	" 8 mm;	" 10.5 mm	

Holotype: ♂ (Or. 229), and Allotype ♀ (Or. 156): Mt. Hermon, 1400 m.. July 15, 1967 leg. L. Fishelson Coll. Dept. of Zoology, Tel-Aviv University.

The species occur on places with low, sparse vegetation.

This practically apterous species of Chorthippus fits well into the essembly of species such as Pezotettix judaica; Sphenophyma rugulosa; Pareuprepocnemis syriaca and Ocneropsis kneukeri, apterous species of Israeli heights. At the same time, Ch. dirshi is the first acridinae in this group, and also the first species which seems to originate from a typical northern stock.

Resembling the male of Ch. satunini Mistshenko from Turkey (Bei-Bienko and Mistshenko, 1951), the male of Ch. dirshi differs by more rudimentary elytra and a widened median field. The female of Ch. dirshi resembles the female of Ch. bucharicus (Bei-Bienko, 1948), differing in the venation of the elytra and the entire absence of red coloration.

Named in honor of Dr. V.M. Dirsh of the British Museum (Nat. Hist.), one of the outstanding acridologists, who helped us much in our work.

Chorthippus peneri sp. n. (Plate II, Fig. 1 to 9)

MALE: Antennae longer than head and pronotum together, flattenend on their basal part, distally with slightly rounded segments; middle segments longer than wide, densely punctate (Fig. 1).

Head as wide as the pronotum, face strongly oblique; frontal ridge pronounced, sulcate from the ocellus downwards; its margins clear and slightly diverging toward the clypeus (Fig. 3). Vertex horizontal; fastigium pentagonal, anteriorly with sharp angles as long in front of the eyes as wide; surface concave and margins punctate. Vertigial faveolae slightly concave and curved, twice as long as broad. Length of eyes greater than the subocular groove.

Pronotum obtuse tectiform with distinct carina; the median keel raised especially over the metazona; the posterior transversal sulcus in middle of the disc, slightly curved, cutting the lateral carinae and median keel before the middle (Fig. 4). The anterior sulcus divides the prozona into two equal parts, cuts the lateral carinae and bends slightly backwards not reaching the keel. The lateral carinae diverge slightly anteriorly, converge sharply before the posterior sulcus and diverge posteriorly, terminating close to the margins of the metazona. Metazona punctate, posteriorly with an obtuse angle. Lateral lobes of pronotum equal in height and length, concave along the transversal sulci.

Mesosternum with a wide space between the lobes; at its narrowest part broader than long (Fig. 7). Metasternal space twice as long as wide.

Elytra and hind wing long, 1/5 of them extending over the hind knees; their apex rounded and maximal width 1/6 of their length, costal vein slightly curved; subcostal and radial straight. Scapular field with parallel veins in the basal part, then strongly dilated with regular slightly curved veinlets; subcostal field with regular vertical veinlets, its greatest width is 1/2 of the greatest coastal field width. Radius-sector with two parallel veins. Median field slightly widened, its greatest width less than that of the costal field. Wing bases transparent and their apical part opaque-grayish.

Subgenital plate pointed; cerci strong, rounded, as long as the plate.

Hind femur slender, four times as long as maximally wide; the inner side with a strong black line. Hind tibia reddish, with 12 spines on the inner line and 13 on the outer. Empodia large, their length 2/3 that of the claws.

Body, especially the genital region and legs, sparsely haired. Coloration: pale brown, dorsal part of head and pronotal disc light brown, lateral carinae whitish, surrounded by blackish-brown. Abdominal segments yellowish red with black regions on the first three terga.

FEMALE: Antennae shorter than head and pronotum together; basal segments from 4th to 8th broader than long (Fig. 2); the 9th to 12th more elongate with lateral sulci on their dorsal surface.

Face moderately oblique; frontal ridge with obtuse margins, concave around the ocellus, slightly diverging downwards. Vertex horizontal, fastigium transversally concave, broader than long. Faveolae slightly curved, anteriorly rounded, 2.5 times as long as wide. Eye longer than the subocular sulcus.

Pronotum with posterior transversal sulcus before the middle; anterior sulcus only marked (Fig. 5). Lateral carinae converge from the front toward the first sulcus, then diverge posteriorly. Median keel raised, especially in the metazona; lateral lobes higher than long, posteriorly granulated with rounded margins.

Sternum with long hairs; mesosternal space wide, 1.5 times broader than long, the margins diverge gradually (Fig. 8). Maximal width of metasternal space equal to its length.

Elytra extending over the hind knee, slightly curved; subcostal and median fields equally wide, with false veins; radius-sector without branches (Fig. 9).

Abdominal tergites vertically densely sulcate.

Ovipositor valvae short, sharply pointed, the ventral one with an enlargement near the base.

Hind femur with a prominent dark line of the inner surface and black spots along the outer carinae; hind tibia grayish, darkly spotted, with 12 spines on the outer and 13 on the inner lines. Empodium more than 1/2 length of claws.

Coloration brown, black spotted laterally and pale dorsally. The anterio-lateral part of the abdomen black, the posterior reddish.

Dimensions:	Body length:	male 17 mm;	female 20 mm
	Elytra :	" 15 mm;	" 18 mm
	Pronotum :	" 3 mm;	" 4.5 mm
	Hind femur :	" 10 mm;	" 12.5 mm

Holotype: male (Or. 236) and Allotype: female (Or. 77), Mt. Hermon, 1800 m. July 15, 1967, in copula. Leg. L. Fishelson, in Coll. Dept. of Zoology, Tel-Aviv University.

This species differs from Ch. binotatus (Charp.), which occurs in Southeastern Europe, by the location of the transverse sulcus. In Ch. peneri it divides the pronotal disc in a shorter prozona and longer metazona, whereas in binotatus the prozona is nearly 1.5 times greater. Also the typical black coloration of the male's hind knee mentioned for the European species is not present in Ch. peneri. The new species differs from the species occurring in Israel, Ch. dorsatus palaestinus Uv. by much shorter faveoli and larger eyes which only in the male are a little longer than the subocular sulcus.

The name Ch. peneri is given in honor of Dr. M. Pener, of the Department of Entomology, Hebrew University.

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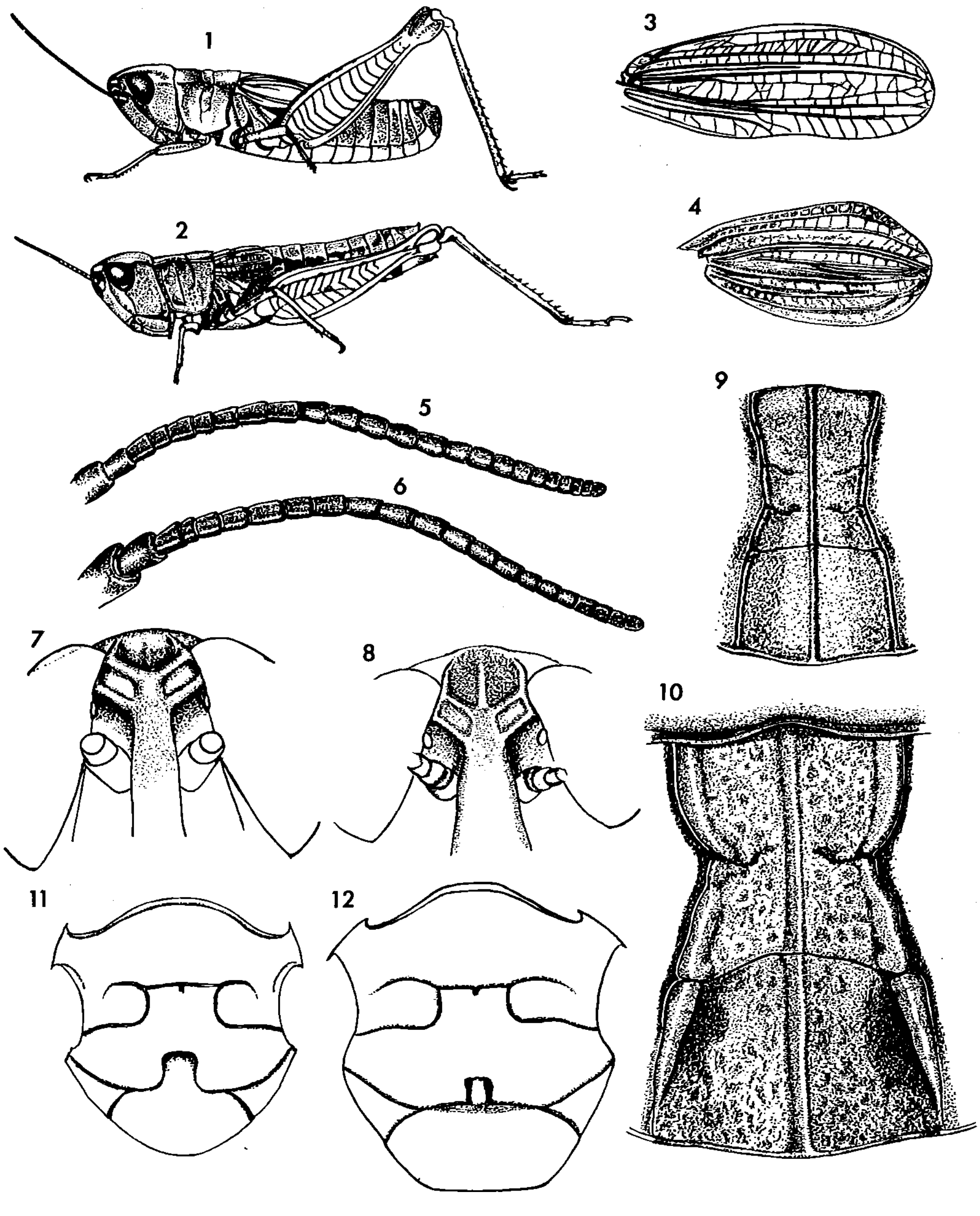
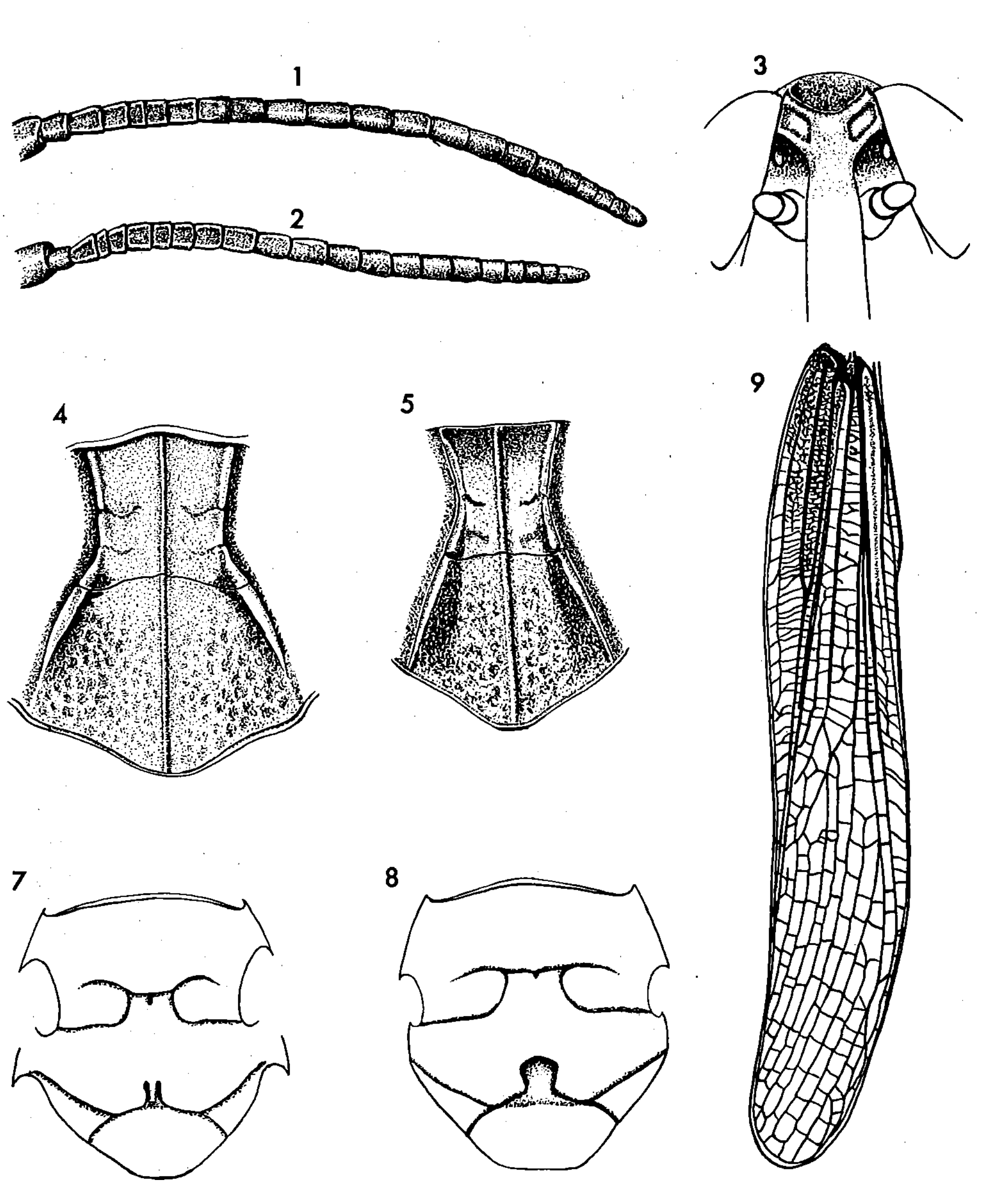


Chorthippus dirshi sp. nov.

Fig. 1. Male. Fig. 2. Female. Fig. 3. Elytra: male. Fig. 4. Elytra: female.
Fig. 5. Antenna: male. Fig. 6. Antenna: female. Fig. 7. Vertex and frons: male.
Fig. 8. Vertex and frons: female. Fig. 9. Pronotum: male. Fig. 10. Pronotum: female.
Fig. 11. Sternal plate: male. Fig. 12. Sternal plate: female.



Chorthippus peneri sp. nov.

Fig. 1. Antenna: male. Fig. 2. Antenna: female. Fig. 3. Vertex and frons: male. Fig. 4. Pronotum: male. Fig. 5. Pronotum: female. Fig. 7. Sternal plate: male. Fig. 8. Sternal plate: female. Fig. 9. Elytra: female.

RESULTS AND DISCUSSION

Trunk and Branches

Counts were carried out at 'En Harod (Jezre'el Valley) during the years 1949-1951, on approximately 100 trees each of the varieties Spadona, Coscia and Gentil. The entire bark was examined, and at some sites the bark was cut open in order to look for aphids.

Table 1

Infestation on bark surface of pear trees at 'En Harod, Aug. .1949 to July 1951.

Month	% of infested trees		
	Spadona	Gentil	Coscia
Aug. -Sept. 1949	0	0	0
October	1	0	0
December	50	0	0
Feb. -July 1950	0	0	0
October 1950	1	0	0
November	10	0	0
December	20	0	1
January 1951	4	0	0
February-July	0	0	0

From Table 1 and from data published elsewhere (10), it is apparent that the aphids inhabit the bark crevices of the Spadona and Coscia varieties throughout the year. During autumn and early winter, when the population reaches its peak, the aphids cover the bark. The variety Spadona is more susceptible to attack than is Coscia (7, 9). With regard to the Gentil variety, no aphids were found on the bark surface and only one colony was found in crevices in the autumn of 1949, on a tree surrounded by 50 infested Spadona trees.

In the autumn of 1964 there was severe damage caused by Aphanostigma on branches of trees in the Hula Valley and Upper Galilee, following which a survey was carried out in 1965-1966 in these areas (Table 2).