

NEW SPECIES OF THE GENUS
ACOCKSACRIS DIRSH
(ORTHOPTERA: ACRIDOIDEA)

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(With 30 Text-figures)

INTRODUCTION

THE material on which the present study is based represents only part of a collection of Acrididae made while in the coastal Namib plain with the Transvaal Museum expedition during May 1958. Other species collected from this interesting area are yet to be described and will form the subject of a later paper.

It is perhaps of interest to give briefly an outline of the unexpectedly rich acridid fauna of the Namib plain. The Kuiseb River area (± 70 m. south-east of Walvis Bay) with which the expedition was primarily concerned consists essentially of an eastern marginal rock and stone belt, largely semi-arid in character with limited zones of small perennial shrublets and occasional seasonal grasses. This zone gradually merges westwards towards the coast into more arid sheets of compacted gravel, which are partly overlain by piles of mobile sand with only an occasional tuft of perennial grass on the more stable parts. The marginal rocky area, in the absence of rain, appears excessively barren though this effect is often more apparent than real. In one particular locality some rain had recently fallen and encouraged a sparse flush of green herbage; here a fairly exuberant grasshopper fauna, comprising about eleven genera, was encountered. Geophilous or lithophilous forms predominated, the only resident phytophilous species was a small *Thericles* eumastacid which frequented the dry upper twigs of the shrublets. Of the geophilous species inhabiting the pebble plains, the flightless stone-like genera *Trachypetrella*, *Lithidium*, *Lithidiopsis* and *Crypsicerus* predominated. Equally conspicuous in this fauna amongst the stones was the curious micropterous, *Acocksacris namibensis*, described below. Fully winged species likewise associated with the stony ground were *Sphingonotus scabriculus* Stal and *Brainia hirsuta* Uvarov, while along the water-courses containing accumulations of gritty sand, a species of *Acrotylus* was often noted. Several late instar nymphs of the southern subspecies of the desert locust *Schistocerca gregaria flaviventris* (Burm.) were also found amongst the bushes; from the rocky hill slopes another species of *Acocksacris* (described here as *A. carpi*) was collected. In this locality and elsewhere upon the plain, even where it was excessively dry and devoid of vegetation, winged adults of *Schistocerca* and *Anacridium* occurred.

Within the inland sand dunes Acrididae were poorly represented. Only the powerfully winged genus *Anacridium* was recorded from this habitat. By day it was seen in moderate numbers amongst the trees dotting the dry bed of the Kuiseb River and was recorded on several nights from the adjacent dunes. There appeared to be some movement at dusk from the tree line into the dunes, where feeding was observed upon the tall tufts of spiky dune grass.

Among other profitable lines of study, the reproduction and survival of these desert-inhabiting grasshoppers must stand foremost. The apterous and brachypterous species, with their limited powers of movement, owe their success undoubtedly to a drought-resistant egg stage, which must be able to withstand long periods of dryness and exploit the patchy and infrequent rainfall to which these areas are subjected. The southern subspecies of the desert locust is in contrast endowed with exceptional mobility and presumably is able to survive in the same manner as its notorious northern relative, being closely linked to the dynamics of weather systems which tend to bring rain and locusts together in the one spot simultaneously. This, and many other equally important problems associated with the desert-dwelling species of Southern Africa, are still to be studied.

I wish to record my sincere thanks to Dr V. M. Dirsh and Sir Boris Uvarov for their kind assistance and advice during the preparation of this paper. I am also indebted to Dr T. H. C. Taylor, Director of the Anti-Locust Research Centre, London and to Dr W. E. China, Keeper of Entomology, British Museum (Natural History), London, for providing both facilities and working space for this study. Finally, my sincere thanks are due to the Director of the Transvaal Museum and Mr B. Carp for kindly providing transport and the opportunity of collecting in the remoter parts of South-West Africa.

The paper was completed while attached temporarily to the Anti-Locust Research Centre, London.

DISCUSSION ON THE GENUS *ACOCKSACRIS* DIRSH

Recently Dirsh (1958) established the monotypic genus *Acocksacris* with *karruensis* as its type species. The salient features of this genus are:

Small with disproportionally large and inflated head. Fastigium of vertex with sharp marginal carinulae and apex open with dorsal concavity continuous with sulcus of frontal ridge. Frons in profile roundly excurved and sloping backwards. Pronotum with linear median carina and indistinct lateral carinae. Mesosternal interspace about twice as wide as long. Elytron short lobiform with rounded apex and extending only to middle of first abdominal segment. Tympanum vestigial. Male subgenital plate subconical, cercus compressed, narrowing towards apex with subacute and oblique apex. Last abdominal tergite with a pair of short rounded projections in male.

The genus *Acocksacris* belongs to the subfamily Truxalinae and is remotely related to the group of genera which include *Lounsburyana* Uvarov, 1922 and *Pseudegnatius* Dirsh, 1956. All three are characterized by having the fastigium of the vertex open at the apex. Field observations indicate that all species are, without exception, geophilous or lithophilous in their habits, frequenting sandy

and rocky localities. Their present known distribution is the arid and karroid-vegetated parts of Southern Africa.

Over the past year, and particularly during the recent Central Namib expedition, a considerable amount of additional material has become available. The present examination of this material reveals four distinct species, all seemingly allied to the recently described *Acocksacris karruensis* Dirsh, 1958.

Some of the more important relationships between the five species are: in all species the fastigium of the vertex has the apex more or less open; elytra are either reduced to a lobiform or abbreviated condition; all have the pronotum with only the basal sulcus crossing the dorsum; in all but one species, *karasensis*, the last abdominal tergite is with small median toothlike projections; all possess a similarly shaped supra-anal plate and laterally compressed but bent cercus. Finally the subgenital plate and epiphallus are similar throughout the five species.

Two of the new species, *namibensis* and *carpi*, agree with the generotype in having the head somewhat rounded in profile. Indeed, in the large series available of the latter species, several specimens exhibit the same inflated head condition which is so characteristic of *karruensis* (though here, too, such a condition may prove eventually to be also exceptional), in other respects, however, they are different. For instance, the fastigium of vertex is open in *karruensis* and partly closed in the two new species. The remaining new species, *geyeri* and *karasensis*, can be separated from the others in having a more pointed and oblique head, but differ in other respects; the first species has the fastigium of the vertex open while in *karasensis* it is partly closed. In this respect *geyeri* has close affinities with *karruensis*. *A. karasensis* probably represents the extreme range of variation found in all five species, but can be linked through intermediates to the generotype. The presence of these intermediates and the absence of characters which justify generic separation leave no alternative but to regard them all as species of the genus *Acocksacris*. Although this incorporates many changes, which must necessarily alter the original generic description as presented above (Dirsh, 1958), I prefer at the present level of our knowledge not to alter it, but leave it in its original form. Perhaps later, when this little-known group becomes better explored, it may be necessary to rearrange the position of some of the more puzzling species.

The genus *Acocksacris* in its present state is therefore regarded as somewhat heterogenous and comprises five species which are probably related to each other in the following order: *karruensis*, *namibensis*, *carpi*, *geyeri* and *karasensis*, of which the last appears to be a somewhat isolated species. Some of the more important relationships existing between the species are discussed below, other less important characters are to be found under the description of the species.

In the males the relative lengths of the elytron constitute an important distinguishing character. This tends to divide the species into two groups, the first comprising species which, like the generotype, have the elytron very reduced, lateral and lobiform; the second, a larger group, which has relatively longer but abbreviated elytra meeting or overlapping dorsally over the abdomen. The relative lengths of elytron and corresponding development of tympanum increases progressively in the following species: *namibensis*, *karruensis*, *carpi*, *geyeri* and *karasensis*. In the females the elytron does not form such a good character, as it is largely lobiform and lateral throughout all species.

The open condition of the fastigium of vertex is also a useful character in the separation of species. It varies in width throughout them all, being widely open in some and partly closed in others. The width of this space decreases progressively in the following species: *karruensis*, *geyeri*, *namibensis*, *carpi* and *karasensis*. In the last three it is more or less partly closed at the apex by the intrusion of the marginal carinulae of the fastigium of vertex.

Another character useful in the separation of species is the shape of the hind margin of the pronotum. In *namibensis* it is strongly incised, while in *geyeri* acutangular and in the others feebly rounded or almost straight.

The absence of submedian appendages from the last abdominal tergite of the male of *karasensis* readily distinguish it from the others where such structures are present.

Although the shape of the supra-anal plate does not provide a good specific character it is very characteristic for the genus and is surprisingly constant in all five species. The epiphallus, and especially the shape of the lophi, however, provides a good specific character for separation of species.

The following key can be conveniently used in the determination of the species.

Key to species of Acocksacris Dirsh, 1958

Males

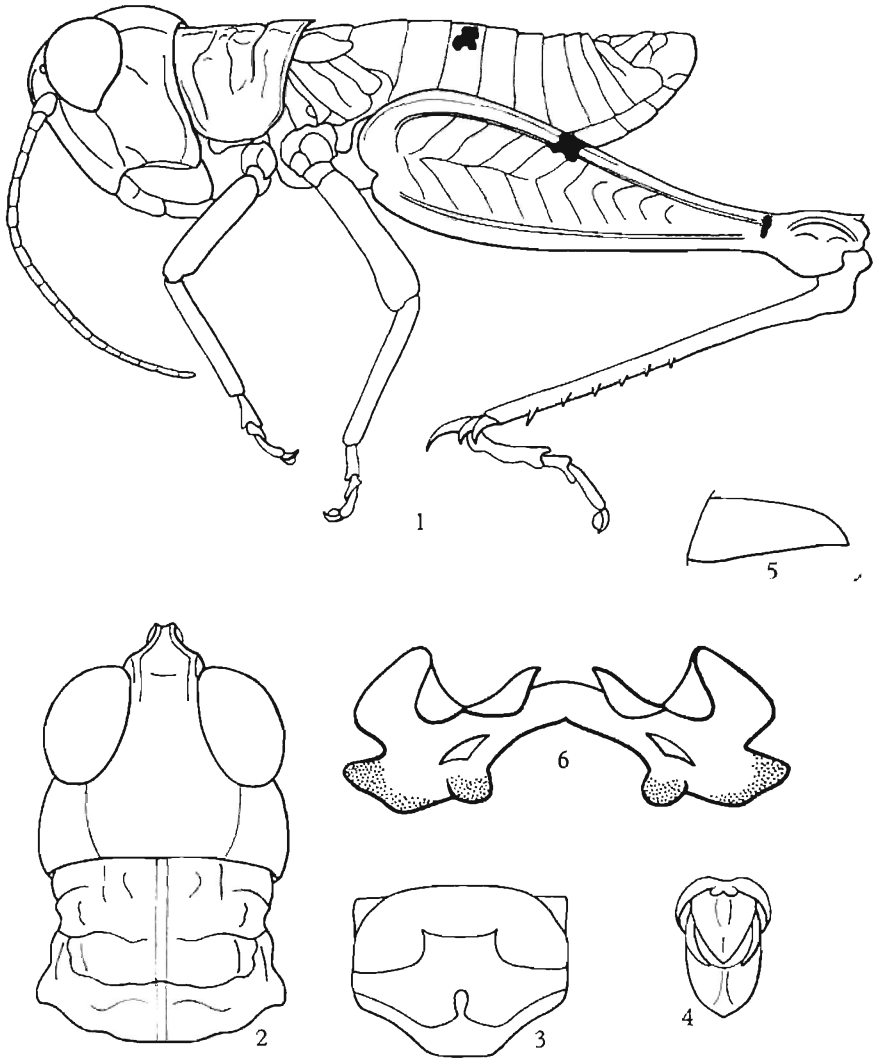
- 1 (4). Elytra very reduced lobiform lateral or concealed beneath pronotum (Figs. 1, 7).
- 2 (3). Fastigium of vertex with apex widely open (Fig. 2). *karruensis* Dirsh.
- 3 (2). Fastigium of vertex with apex partly closed (Fig. 8).
namibensis sp.nov.
- 4 (1). Elytra reaching about half way along abdomen, dorsally meeting or overlapping (Figs. 12, 19, 24).
- 5 (6). Fastigium of vertex with apex deeply open. Pronotum with acutangular hind margin (Fig. 20). *geyeri* sp.nov.
- 6 (5). Fastigium of vertex with apex partly closed. Pronotum with hind margin broadly rounded or straight.
- 7 (8). Head somewhat rounded in profile. Last abdominal tergite with submedian projections (Fig. 15). *carpi* sp.nov.
- 8 (7). Head in profile more oblique with pointed apex. Last abdominal tergite with no projections (Fig. 27). *karasensis* sp.nov.

Females

- 1 (4). Tympanum very much reduced or vestigial.
- 2 (3). Fastigium of vertex widely open. Elytra lobiform reaching only to first abdominal segment. *karruensis* Dirsh.
- 3 (2). Fastigium of vertex partly closed. Elytra hidden beneath pronotum. *namibensis* sp.nov.
- 4 (1). Tympanum well developed, comparatively large.
- 5 (6). Fastigium of vertex widely open; pronotum with hind margin acutangular. *geyeri* sp.nov.
- 6 (5). Fastigium of vertex with apex partly closed.
- 7 (8). Subgenital plate with median triangular projection; elytron with weakly excurved anterior margin, costal vein very feebly developed (Figs. 17, 18). *carpi* sp.nov.
- 9 (8). Subgenital plate obtusangular with simply pointed apex, elytron with widened precostal and costal area, costal vein strongly developed (Figs. 29, 30). *karasensis* sp.nov.

The types are all deposited in the Transvaal Museum, Pretoria; paratypes are in the British Museum (Natural History), London; the National Collection of Insects in the Division of Entomology, Pretoria, and the Academy of Natural Sciences, Philadelphia.

The method used for extracting the genitalia is the same as that described by Dirsh (1956a). The epiphalli are, however, figured differently from this author. A more anterior and dorsal view is used to give a better profile of the lophi.



Figs. 1-6. *Acocksacris karruensis* Dirsh. 1, Whole insect, ♂-type; 2, head and pronotum above; 3, meso- and metasternum; 4, end of abdomen, above; 5, left cercus (all after Dirsh, 1958); 6, epiphallus.

DESCRIPTION OF SPECIES

Acocksacris karruensis Dirsh (Figs. 1-6)

Besides the original type series from the Koup Area, Great Karroo (C.P.), another female is now available from Carnavon (C.P.) with the date 21 Nov. 1957 (A. L. Reynecke). The head is not greatly swollen in this specimen.

***Acocksacris namibensis* sp.nov. (Figs. 7-11)**

MALE (type). Body very small and slender, very nymph-like in general appearance.

Antenna much longer than head and pronotum together, composed of 23 segments which are compressed at apex. Fastigium of vertex narrowly pentagonal, sloping forwards with dorsal concavity and raised lateral carinulae which partly block the sulcus at apex of fastigium of vertex. Head above rounded; frons in profile excurved; frontal ridge strongly raised between antenna, narrowed at apex but widened below, with moderately deep sulcus and raised marginal carinulae; facial carinulae strongly developed and excurved in profile.

Pronotum small, cylindrical, with indistinct median and lateral carinae, posterior margin of pronotum broadly incurved; dorsum of pronotum crossed by wide basal sulcus only, the other two sulci are very indistinct. Prozona more than twice as long as metazona. Metasternal interspace about three times as wide as long; mesosternal lobes with rounded inner margins; metasternal interspace small and oval. Elytron vestigial and hidden beneath pronotum. Tympanal organ reduced; last abdominal tergite with two small tooth-like projections.

Fore and mid-legs slender; hind femur slender with convex outer surface and strong fish-bone pattern; arolium about as long as claw. Supra-anal plate triangular with apical tongue-like projection, in middle crossed by weakly raised transverse carina and with sulcate base. Cercus from above moderately compressed and curved inwards, in profile tapering strongly and with pointed apex; subgenital plate short, conical, with rounded apex. Epiphallus with large ancorae and with strongly curved, lobed and shouldered lophi which are covered all over with small teeth.

General coloration light sandy brown with scattered areas of black, extending dorsally along head and pronotum is a pale longitudinal stripe bordered by black. Pronotum above with faint X-shaped pattern. Anterior and middle legs with scattered dark fasciae. Cheeks, as with outer surface of hind femur, are greyish white, upper side of hind femur with mottled areas of brown, knee on outside black; hind tibia pale lucid white with external pre-apical black stripe; tibial spines and spurs are capped with black.

FEMALE (paratype). Similar to male but much larger. Fastigium of vertex wider above; lateral carinae of pronotum more strongly developed towards margins of pronotum. Supra-anal plate roundly triangular; cercus short, triangular, with acute apex. Ovipositor valves relatively robust, with blunt apices; subgenital plate with widely excurved apex.

General coloration similar to male but with more white on head, pronotum and hind femora.

Length of body—♂: 6.8-7.3, ♀: 9.8-11.4; pronotum—♂: 1.2-1.3, ♀: 1.6-1.8; hind femur—♂: 5.0-5.4, ♀: 6.2-7.4 mm.

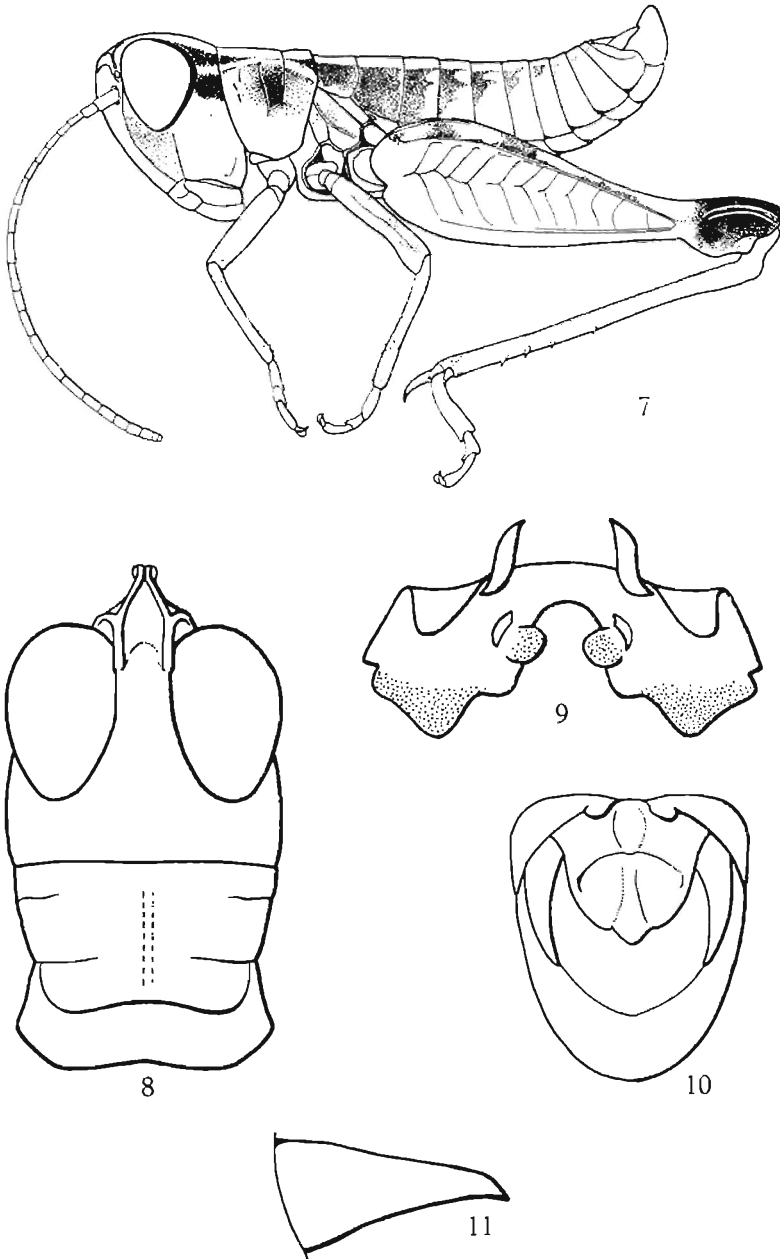
MATERIAL EXAMINED. South-West Africa: Central Namib, Kuiseb River, 18 m. north-east of Gorab Copper Mine, 12 and 18 May 1959, 6 ♂♂ and 21 ♀♀ (including the ♂-type). R. F. Lawrence, R. Paulian, H. D. Brown.

This is the smallest species of the genus and is readily distinguished by the partly closed fastigium of vertex, severe reduction of elytra which are reduced to mere vestiges and covered by the pronotum, the emarginate posterior margin of pronotum, the partial development of the sulci in the prozona and lastly by the very differently shaped epiphallus.

Besides some colour variation, there is also slight morphological variation in the paratypes, especially in the development of the median and lateral carinae of the pronotum. In several ♂- and ♀-paratypes they appear weakly developed in the prozona. Also, the fastigium of vertex varies somewhat at the apex, it is more

open in some paratypes than in others but never approaches the widely open condition of *karruensis*.

Acocksacris namibensis is a truly geophilous insect found springing about the extensive pebble-strewn plains of the marginal Central Namib. It is associated



Figs. 7-11. *Acocksacris namibensis* sp. nov. 7, Whole insect, ♂-type; 8, head and pronotum above; 9, epiphallus; 10, end of abdomen, above; 11, left cercus.

with slightly undulating sheets of compacted, wind-rounded stones and gravels where the only vegetation is a sparse sprinkling of annual grasses (mainly a short feathery *Aristida* species) and a few odd gnarled perennial shrublets of the genera: *Salsola*, *Monechma* and *Zygophyllum*. While the grass is scattered about singly amongst the stones the shrublets exist in irregular belts along the margins of dry water-courses. These small grasshoppers are very difficult to spot as they blend closely with the coloration of the gritty and stony substrate. When alarmed they jump powerfully away covering distances of several feet at a time. To see and catch them one has to walk slowly across the stones with eyes fixed on the ground and rely upon their movement giving away their position. On windy days, which are all too frequent, debris blown across the ground easily confuses the collector, and the species is exceedingly difficult to spot, let alone capture. A favourite perch of the small males is atop one of the stones which everywhere litter the ground. Several copulating pairs were noticed, but these rapidly separated when disturbed. When trapped within the net they have a knack of crawling out from under the edge and successfully making their escape.

***Acocksacris carpi* sp.nov. (Figs. 12-18)**

MALE (type). Body small and slender with abbreviated wings.

Antenna longer than head and pronotum together with 23 segments which are feebly compressed at base and towards apex. Head above, rounded; fastigium of vertex sloping downwards, pentagonal, concave above, with apex partly blocked by marginal carinulae, which extend backwards parallel between eyes; frons in profile oblique, feebly rounded and forming at vertex an obtusely rounded angle. Frontal ridge strongly raised between antennae, narrowed apically, sulcate and with raised lateral margins; facial carinulae sloping roundly backwards; eyes round, strongly convex.

Pronotum with indistinct median carina which is cut only by posterior sulcus; hind margin of pronotum from above broadly excurved; prozona twice as long as metazona, dorsally with two, incomplete, deep sulci present. Mesosternal interspace about twice as wide as long, with straight, rounded on inside, lateral lobes; metasternal interspace closed; clytron short, reaching about halfway along abdomen to about fourth abdominal segment (in some paratypes to fifth segment), dorsally meeting or slightly overlapping and with narrowly rounded apex. Wings very much reduced and vestigial. Tympanal organ well developed, comparatively large.

Legs slender and covered with some short white hairs; hind femur with well developed fish-bone pattern; arolium slightly longer than claw. Supra-anal plate triangular with notched appendicular apex; cercus slightly compressed, incurved; in profile strongly curved downwards with tapering and pointed apex; subgenital plate with upcurved and rounded apex; last abdominal tergite with two small rounded sub-median projections. Epiphallus with small lobes on inside, lophi strongly rounded, ancorae are strongly projecting.

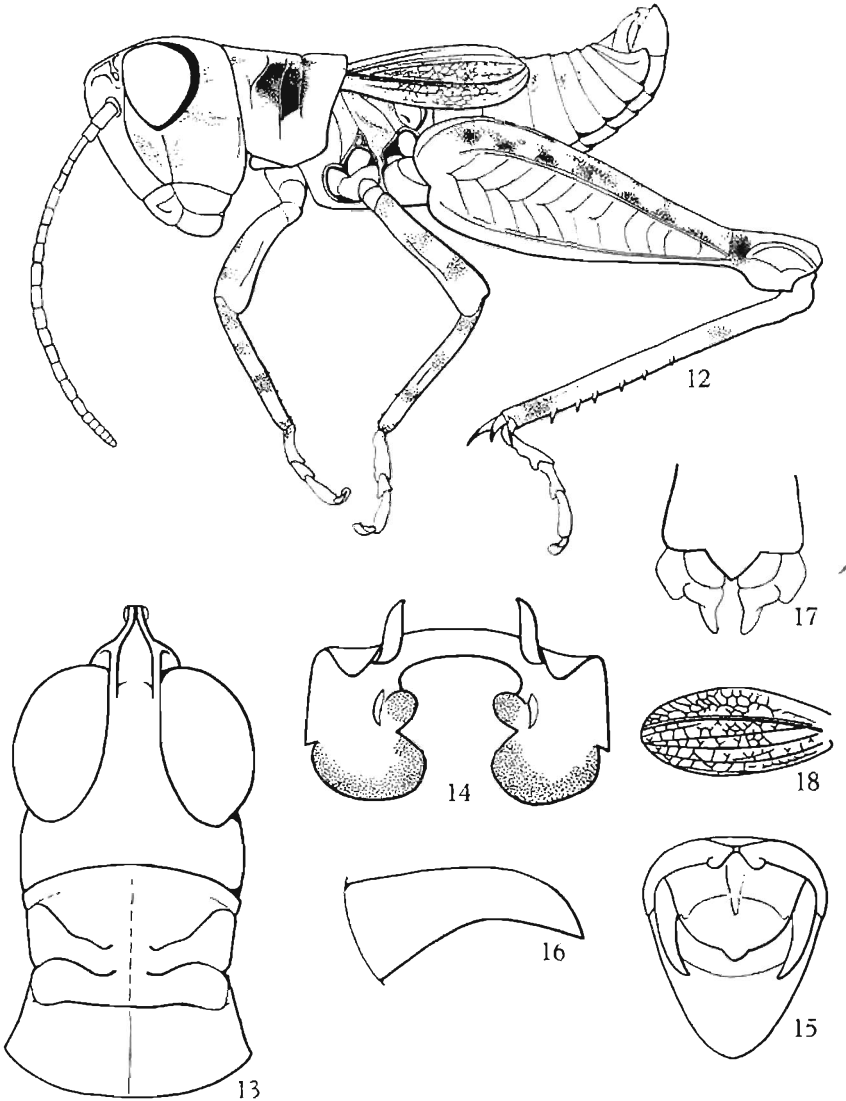
General coloration greyish brown. Head grey darkening above on occiput. Pronotum with central and lateral black area. Base of abdomen reddish yellow brown. Anterior and middle legs are with small dark fasciae; hind femur with scattered dark brown areas on upper surface; hind tibia with black fascia near apex; apices of tibial spines are black.

FEMALE (paratype). Similar to male but much larger. Elytra comparatively shorter and more lateral, not meeting or overlapping above. Supra-anal plate triangular; cercus short and triangular with sharply pointed apex. Valves of ovipositor comparatively large; subgenital plate with triangular, median projection and straight lateral areas.

General body coloration is a dark mottled brown.

Length of body—♂: 9.1–9.6, ♀: 12.4–14.4; pronotum—♂: 1.6–1.9, ♀: 2.2–2.5; elytron—♂: 2.1–3.1, ♀: 2.1–2.7; hind femur—♂: 5.7–6.5, ♀: 7.2–8.6 mm.

A large series of specimens, collected from four different localities on the inland



Figs. 12–18. *Acocksacris carpi* sp. nov. 12, Whole insect, ♂-type; 13, head and pronotum above; 14, epiphallus; 15, end of abdomen, above; 16, left cercus; 17, female subgenital plate; 18, female left elytron.

plateau and marginal semi-desert zone, show some variation in size, length of elytron and development of carinulae of frontal ridge which in some specimens may not attain margin of clypeus. In several of the paratypes the head is strongly inflated and in this respect bear a close resemblance to *karruensis*.

MATERIAL EXAMINED. South-West Africa: 8 m. north of Keetmanshoop, 3 May 1959, 8♂♂ and 5♀♀; 7-10 m. south of Gibeon, same date, 5♂♂ and 1♀; Djab farm, 1♂ and 7♀♀ and Rostock farm, 11♂♂, Upper Kuiseb River, 8 May 1959; 18 m. north-east of Gorab Copper Mine, Middle Kuiseb River, 12 and 18 May 1959, 5♂♂ and 2♀♀ (including ♂-type). B. Carp, A. Poort, H. D. Brown.

This brachypterous species resembles *geyeri* and *karasensis*, but can be separated from both by the more rounded profile of the head. It is nearest to *namibensis*, particularly in respect of the shape of the head, but is distinguished as follows:

<i>carpi</i>	<i>namibensis</i>
pronotum with hind margin rounded; all three sulci well developed on dorsum	pronotum with hind margin strongly incurved; only basal sulcus is well defined
elytron and tympanum well developed	elytron hidden and tympanum very reduced

This is a widespread common species, which was collected from many different localities on the elevated inland escarpment and on the low hills of the coastal desert plain. Those specimens from Keetmanshoop and Gibeon were collected from partly eroded hilly areas of loose splintered shale, which were colonized by an open bush community of *Rhigozum trichotomum* and numerous small tufts of dry *Aristidia* and *Enneapogon* grass. The series taken from the Kuiseb escarpment inhabited very much more arid and rocky areas which were largely devoid of bushes and had only a sparse withered grass cover. On the other hand, the series taken from the rocky outcrops, which form the hills of the marginal desert plain, were collected on areas of gravel colonized by infrequent low cushion shrublets (mainly *Monechma* species) and a good sprinkling of a short annual *Aristida* grass species. For a geophile they have somewhat unusually wide habitat preferences, being found on soils of varying texture, including loose shaley splinters, slabs of micaschist and rounded wind-polished stones. They are, like the preceding species, very powerful jumpers and not easily collected. Both sexes may be seen moving about fairly actively in the hot sun or often perched on top of prominent stones or rocks. Many copulating pairs were seen. Several of the areas, where they were taken, were exceedingly dry with no green herbage present at all. In such arid localities they seemed the only successful acridid about, and are presumably able to exist happily upon withered plant remains from the previous season.

This species is named after Mr B. Carp, well-known Cape naturalist who led the expedition and who assisted in its collection.

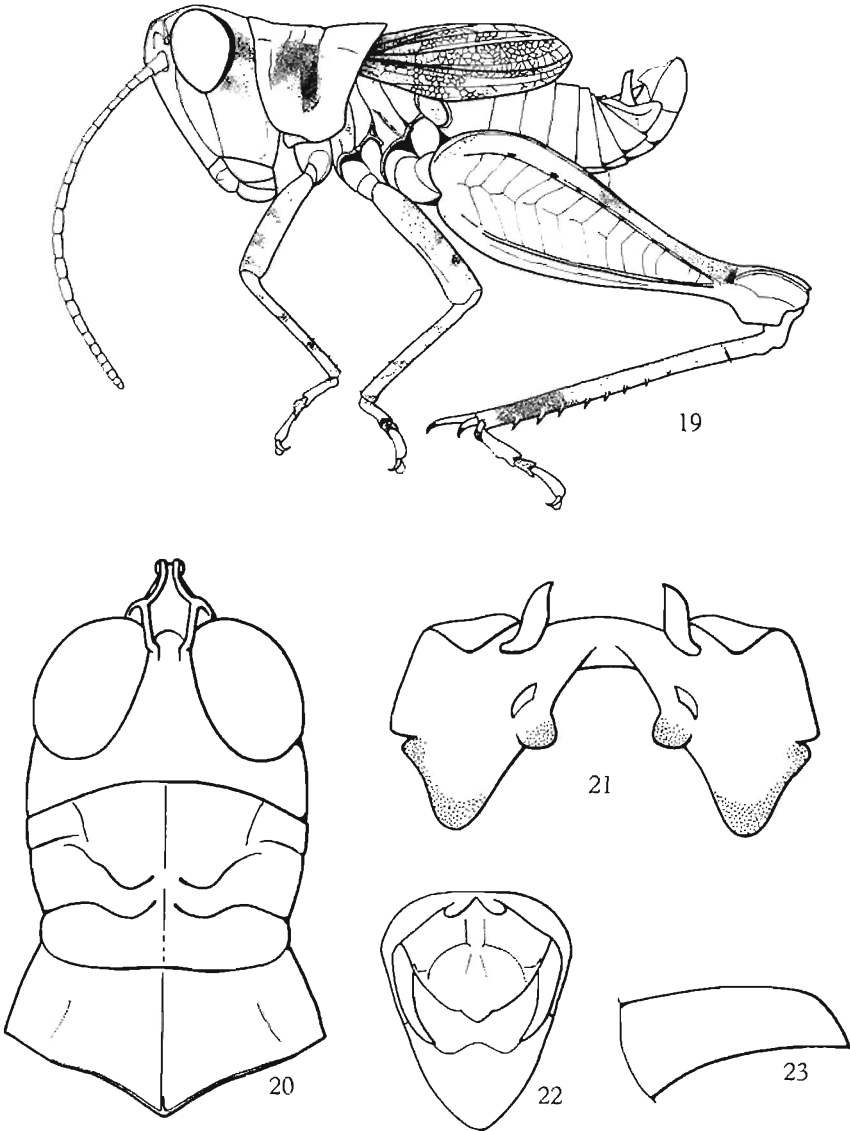
Acocksacris geyeri sp.nov. (Figs. 19-23)

MALE (type). Body small and slender with abbreviated elytra.

Antenna longer than head and pronotum together, consisting of 23 segments which are compressed towards the apex. Head in profile somewhat oblique with pointed apex; fastigium of vertex widely pentagonal with raised lateral margins, open at apex and with deep dorsal concavity and well-developed transverse basal furrow; frons in profile excurved between antennae, otherwise straightly sloping backwards; frontal ridge sulcate, with raised lateral carinulae narrowed apically and diverging below.

Pronotum with linear median carina and very indistinct lateral carinae; dorsum of pronotum with three distinct transverse sulci, only the posterior one is complete. Prozona about one-and-a-half times as long as metazona. Anterior margin of pronotum above slightly excurved, posterior margin strongly triangular with acutangular apex. Meso- and metasternal interspace the same shape as for other species of the genus. Elytra with rounded apex, weakly expanded anterior margin, overlapping dorsally over base of abdomen and reaching to about fifth abdominal

segment (in some paratypes to seventh segment). Tympanal organ well developed. Supra-anal plate roundly triangular, sulcate at base and with small tongue-like apical projection; cercus incurved from above; in profile slightly curved and with almost truncate, acute apex; subgenital plate short with rounded apex; last



Figs. 19-23. *Acocksacris geyeri* sp. nov. 19, Whole insect, ♂-type; 20, head and pronotum above; 21, epiphallus; 22, end of abdomen, above; 23, left cercus.

abdominal tergite with two small submedian projections. Arolium shorter than claw. Epiphallus with small toothed inner lobes and large tongue-shaped lophi, ancorae very prominent.

General coloration reddish brown. Head with black cheeks; pronotum above with dark lateral areas bordering pale brown dorsal parts. Fore and middle legs with scattered alternating bands of black; upper carina of hind femur with small black spots and with transverse apical fascia just before knee; hind tibia greyish brown, suffused with a little black, which towards apex forms a prominent black fascia; tibial spurs are with black apices.

FEMALE (paratype). As the male but larger. Fastigium of vertex wider and with deeper transverse fastigeal furrow. Elytron somewhat lateral and lobiform and only extending to third abdominal segment. Cercus simple, triangular with acute apex; valves of ovipositor relatively robust; subgenital plate with slightly excurved median apical part and sinuately curved lateral ones.

General coloration more or less similar to male, but with yellow markings on metazona of pronotum, approximating to the normal X-like pattern but of a more globular shape. In living specimens these markings are very prominent.

Length of body—♂: 7.9–9.4, ♀: 11.7–16.6; pronotum—♂: 1.8–2.1, ♀: 2.7–3.2; elytron—♂: 2.0–3.6, ♀: 3.0–3.8; hind femur—♂: 5.8–7.2, ♀: 8.8–10.3 mm.

MATERIAL EXAMINED. South Africa: Cape Province, 2 m. east of De Aar, 11 ♂♂ and 13 ♀♀, 1 nymph (including ♂-type); 14 m. east of Hanover 1 ♂ and 1 ♀, all on 13 Feb. 1959. A. S. Steenekamp, H. D. Brown.

This species is easily distinguished from the preceding species, *namibensis* and *carpi*, by the pointed profile of the head and by the widely open fastigium of vertex. The shape of the pronotum and the longer elytra readily separate it from *karuensis*. In the shape of the head *geyeri* resembles *karasensis*, which differs, however, in having a closed fastigium of vertex and lacks dorsal projections from the last abdominal tergite in the male. The epiphallus is also quite distinct.

The new species is named after Dr J. W. C. Geyer, Chief, Division of Entomology, Pretoria, who has done much to facilitate and encourage the further exploration of the Acrididae of South Africa.

In habits this species is geophilous, being found on the hard ground between irregular zones of cushion shrublets (mostly species of *Eriocephalus*, *Pentzia* and *Lycium*) and mat-forming grasses (*Eragrostis* and *Cynodon* species). They leap about with incredible power when disturbed and plunge headlong into the stippled zones of vegetation. Males, due to their smaller size and greater agility, were more difficult to capture than the females, which were moreover easier to recognize with their prominent yellow X-like pattern on the pronotum. Several copulating pairs were observed, but these were very much on the alert and rapidly separated when pursued. Several specimens collected from near Hanover (60 miles to the east of De Aar), were taken from similarly well-vegetated areas on the pebbly slopes of low dolerite hills. Further eastwards and southwards at Noupoort and Middelburg this curious insect appears to be absent.

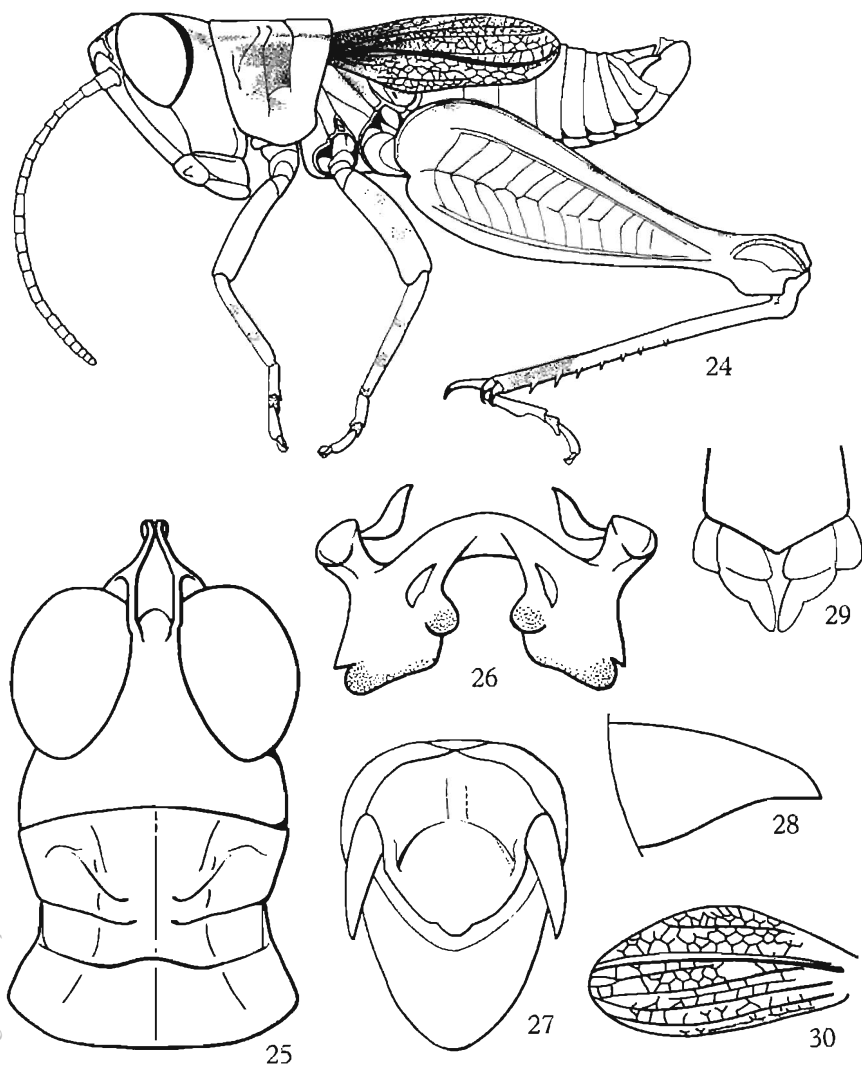
Acocksacris karasensis sp.nov. (Figs. 24–30)

MALE (type). Body small and slender with abbreviated wings.

Antenna longer than head and pronotum together with 23 filiform segments, slightly compressed towards apex. Head with angular apex; fastigium of vertex pentagonal with posteriorly convergent and raised lateral carinulae which become obsolescent between eyes; with shallow dorsal concavity and with apex of fastigium of vertex partly closed; frons in profile very oblique, frontal ridge sulcate with strong lateral carinulae which are continuous with those of fastigium of vertex.

Pronotum with linear median carina, dorsum crossed by basal transverse sulcus only; hind margin of pronotum feebly rounded, almost straight. Prozona, with two deep, incomplete sulci, and about twice as long as metazona. Meso-

sternal interspace about twice as wide as long. Elytra abbreviated, dorsally overlapping and extending to middle of fifth abdominal segment (in some paratypes to fourth segment only) and with swollen anterior margin. Tympanal organ comparatively large and well developed. Hind femur with very convex external



Figs. 24-30. *Acocksacris karasensis* sp. nov. 24, Whole insect, ♂-type; 25, head and pronotum, above; 26, epiphallus; 27, end of abdomen, above; 28, left cercus; 29, female subgenital plate; 30, female left elytron.

surface and distinct fish-bone pattern; arolium slightly shorter than claw. Last abdominal tergite with no submedian projections. Supra-anal plate heart-shaped with small triangular apical projection and feebly raised transverse ridge across middle; cercus comparatively short, somewhat triangular and tapered sharply towards apex, which is oblique. Subgenital plate with rounded apex. Epiphallus

with incurved flattened lophi and small toothed lobes on inside, anterior projections strongly developed, ancorae very prominent.

General coloration reddish brown. Lateral area of pronotum with centrally located black patch. Median dorsal area of head and pronotum with a pale brown stripe. Upper carina of hind femur with scattered black spots; hind tibia with wide black fascia near apex.

FEMALE (paratype). Similar to male but much larger and with head less angular and oblique. Elytra lateral, shorter than male, with anterior margin strongly excurved and with strongly developed costal vein. Supra-anal plate triangular; cercus short and triangular; valves of ovipositor robust; subgenital plate simply pointed at apex.

General coloration similar to male but with rudimentary pale X-like pattern on pronotum.

Length of body—♂: 8.2-9.8, ♀: 13.8-14.1; pronotum—♂: 1.7-2.0, ♀: 2.5; elytron—♂: 2.7-3.7, ♀: 2.4-2.9; hind femur—♂: 6.0-7.2, ♀: 8.7 mm.

MATERIAL EXAMINED. South-West Africa: Karasberg Mountains, 29 m. south of Aroab, 6 ♂♂ and 1 nymph (including ♂-type), 10 Feb. 1959, A. S. Steenekamp and H. D. Brown; 18 m. south of Warmbad, 4 ♂♂ and 2 ♀♀, 2 May 1959, H. D. Brown.

There is a certain resemblance in the angular shape of head, particularly between the males of this species and *geyeri*. However, *karasensis*, with its partly closed fastigium of vertex, rounded hind margin of pronotum, shorter more triangular cercus, absence of projections from last abdominal tergite and differently shaped epiphallus, is quite distinct. In the females some confusion results from close resemblance with *carpi*, but they can be distinguished by the different shape of fastigium of vertex which is more pronounced and angular in *karasensis*, the elytron which is oval in *carpi* but strongly swollen along its anterior margin in *karasensis*, and by the shape of the subgenital plate which is simple and pointed in *karasensis* and with a distinct median triangular projection in *carpi*.

The small series of males from the Karasberg Mountains vary slightly in their smaller size and redder ground coloration from the Warmbad series, which are with more brown.

The series, from which the type was selected, were collected from rubble-strewn slopes of sandstone hills which form the eastern edge of the Great Karasberg escarpment. This is a semi-arid area supporting only sparse vegetation of low, widely spaced *Rhigozum trichotomum* bushes and restricted grass cover. On the stony slopes amongst the bush stipple, *A. karasensis* is normally found moving erratically about with intense waving movements of antennae. When disturbed it can perform powerful jumps, which carry it great distances across the ground. This frequently results in the species alighting on the lower twigs of the bushes, where they remain perched for a short while before resuming their normal position on the rubble. This combination of jumping power and small size does not make their capture easy. Judging from the numbers of nymphs, the general condition of some males and the absence of females in the Karasberg area it was apparent that they had only recently emerged, and their presence seemed associated with recent rainfall as evidenced by the green condition of the herbage. They were observed feeding upon the green shoots of an *Aristida* grass.

The small series from farther west, near Warmbad, confirms that the species is strongly geophilous and appears to be associated with stony hillsides. This locality was intersected by numerous dry water-courses amongst loose dolerite outcrops with a sparse cover of bushes and isolated tufts of grass confined to the drainage channels. To the north of Warmbad the countryside becomes flatter, with outcrops of quartz appearing and, although rain had also fallen here, no specimens of this curious insect were seen.

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