

(4) *Ecological divisions of the Namib*

According to edaphic features we can divide the Namib into three longitudinal sections which lie next to one another from the coast towards the highlands. These sections are the littoral sands, the barchan dunes and the consolidated sand to rocky soil surfaces of the plains. To these have to be added special biotopes such as the more hygrophilous or halophilous strata of river-beds, pans, etc.

A special eco-fauna of Tenebrionids corresponds to each of these sections.

A rough longitudinal division of the Namib has been accepted also from the point of view of climatology, viz. into an outer section or coastal and true fog belt, and an inner Namib which is the inland area gradually rising towards the slopes of the highlands. This is roughly based on the characteristic precipitation formula of the Namib, correlating the increase of rainfall with the decrease of sea mist from the coast eastwards. Although this division has been applied by various authors, such as Walter to the vegetation, Gebien to the Tenebrionids, Mertens to the reptiles, etc., it seems to be of a lesser importance for the ecology of the apterous ground Tenebrionids than are edaphic features. According to the distribution pattern of many Namib-Tenebrionids, these beetles are somewhat indifferent to the degree of air moisture but depend very much on the soil conditions. Various dune Tenebrionids such as *Lepidochora*, *Arthrochora*, *Stips stali*, *Namibomodes*, *Onymacris*, etc., occur not only under the conditions of a high degree of air moisture as met with close to the coast (e.g. Luderitz, Rooibank, Swakopmund), but were found also in areas far out of the fog belt, e.g. at Namtib, a site which is situated quite 80 miles from the sea (cf. map 3). The same seems to apply to various reptiles; *Palmatogecko rangei* has been observed on the practically littoral sands of Luderitz and Moçamedes, but also in the marginal area of the barchan dunes opposite the farm Arib (north-west of Abbabis), viz. about 80 miles inland from the coast as the crow flies (cf. map 4). Similar cases can be reported also of animals living on consolidated gravel grounds; *Stenocara eburnea* believed to be confined to the coastal area, was collected recently as far inland as the Mesum Mountains, while the gecko *Pachydactylus kochii* has been noted at Cape Cross as well as the inland station Gobabeb.

A. *Littoral sands*

As opposed to the eastern (or Indian) coast, the Atlantic coast of Africa is very poor in Tenebrionids pertaining to the circum-African littoral sand fauna proper.

On the eastern coast the proliferation of the littoral genera is remarkable, consisting of *Trachyscelis*, *Macrotrachyscelis*, *Plesioderes*, *Cornopterus*, *Nesocaedius*, *Corinta*, *Ammobius*, *Freyula*, *Diaderma*, *Heterocheira*, *Diphyrhynchus*, certain species of *Falsammidium* and the subgenus *Apteroclitobius* of *Clitobius* (cf. Koch, 1960a). Some of these Indian elements have expanded along the eastern and Mediterranean coasts of the continent as far as southern Morocco in the north-west (viz. *Trachyscelis*, *Ammobius* and *Nesocaedius*), and to the south-eastern Cape Province in the south (*Cornopterus*).

The Atlantic elements, however, are very poorly represented and are confined to the genera *Ammidium* and *Falsocaedius*, to which *Phaleriderma*, an endemic genus of the littoral sands of the Cape Province, can be added.

In conformity with this development the Namib lacks any specialized element of the circum-African littoral sand fauna; there is only *Ammidium namibense* from the tropical part of the Atlantic coast, which has expanded southwards as far as the Skeleton Coast. There are also species of the indifferently psammophilous genera *Caedius* and *Clitobius* (s.str.), while the tidal Phaleriini of worldwide distribution are represented by the phyto-sarcophagous genus *Pachyphaleria*.

This genus is endemic to the whole west coast of Southern Africa and, in appearance, recalls to an amazing extent the Phaleriini-genus *Phalerisida* from the Chilean coast.

There are, however, quite a number of species belonging to continental groups, which have become adapted to the biotope of littoral and sublittoral sands. They are all endemic to the Namib, but found only on sites where the coast forms a littoral plain; they strictly avoid the barchan dunes, however, and are absent even from sites where these dunes drop directly to the sea (e.g. north of Hottentot Bay). Such species of strictly littoral habits are **Brinckia debilis*, *vaga*, **serratina* and *insularis*, *Onychosis gracilipes*, *Carchares macer*, etc. **Brinckia insularis* is one of the few species known to occur also on the small Namib islands; it was discovered on Possession Island, but was later collected again on the mainland.

Another group shows less strictly littoral tendencies in representing a link between the littoral and dune habitats. To this group belong, among others, *Carchares granulosa* and the stem of the 'white' *Onymacris* of the Northern Namib. *Onymacris marginipennis*, with its subspecies *palgravei* and *nigropunctata*, as well as *Carchares granulosa*, are found only in close proximity to the coast, on wind-blown sand or at the foot of marginal dunes, as long as there is vegetation. In many cases *Onymacris marginipennis* was observed to agree in its habitat with that of the strictly littoral **Brinckia debilis*, e.g. on the sands of the small and isolated beach of Henties Bay.

The other species of the 'white' *Onymacris* (viz. *candidipennis*, *bicolor*, *brincki* and *langi*) keep generally in proximity to the coast, but some of them (*candidipennis*, *bicolor marshalli* and *brincki*) have conquered also the barchan dunes, and in some places have spread inland as far as there exists a continuity of wind-blown sand which is not separated from the coastal dunes by any kind of hard-ground barrier. The apparently quite abnormal occurrence of the 'white' *Onymacris *visseri* in the mountains of the Kaokoveld can be explained by the above reasons. This species lives on the blown sand of the N'Gola flats in the Marienfluss depression, which is flanked on either side by the Hartmann Mountains in the west and the Baynes Mountains in the east. The parts of the Marienfluss depression, however, where *Onymacris visseri* occurs, are situated still within the 600 m. contour and form 'river-pockets' of low ground, which communicate with the low ground of the coastal Namib by the way of the Cunene River depression in the north and penetrate southwards between the mountains round the northern slopes of the Hartmann Mountains (cf. map 6). A parallel case of dispersal can be reported of *Protodactylus*, the type species of which (*opticus*) was known from the Moçamedes desert, while another species (**sanctae-mariae*) was recently discovered also in the N'Gola flats of the Marienfluss depression.

B. *Barchan dunes*

This biotope is peculiar to the True Namib and harbours the most autochthonous elements of the Namib fauna. An analysis of the strictly dune-loving Tenebrionids shows that they all belong to endemic species and in most cases also to endemic genera. It seems that these strictly dune-loving species are unable to migrate back to the adjacent, extra-dune soil surfaces which, even if formed by sand, may differ from the coarse dune-sand in composition, compactness and granularity. Thus the dune species are wholly confined to the dunes and can probably not exist elsewhere.†

† Dune Tenebrionids, which were kept in the insectarium on artificial or river sand, soon damaged the armatures of legs and lost the tactile sense bristles and lateral cilia of body; in the *Lepidochora* the knife-sharp lateral margin of elytra became pierced and broken in places.

Endemic genera of the barchan dune section are the following: *Namibomodes*, **Uniungulum*, *Calognathus*, *Fossilochile*, *Archinamibia*, *Eustolopus*, *Namibismus*, *Lepidochora*, *Arthrochora*, *Cardiosis*, *Tarsosis*, *Anisosis*, *Ophthalmosis*, *Dactylocalcar*, *Gyrosis*, *Cerosis*, *Periloma*, *Psammogaster*, *Syntyphlus* and *Vernayella*. Strictly endemic dune species have been developed also in genera which, in one way or the other, are diffused also outside the true barchan dunes. Such genera are *Phanerotomea*, *Pachynotelus*, *Onymacris*, *Stenocara*, *Stips* and *Caenocrypticus*. Of the several hundred species of the psammophilous Pan African genus *Zophosis* not a single one has gained access to the dunes, nor do I know of any Tenebrionid species which occurs on the sand of dunes and also on other soils.

While many of the endemic genera are monotypical, the speciation in others is remarkably high, with *Lepidochora* composed of nine different forms, *Vernayella* and *Namibomodes* each numbering four species, *Cardiosis* ten forms, etc. In the genera mentioned, and also *Onymacris* and *Pachynotelus*, a split into two to four sympatric species has often taken place, due probably to the adaptive response of the respective forms to subtle differences in the conditions of ecological niches.

The main ecological niches which exist in the barchan dune area, and to which the respective inhabitants react in a convergent manner, are the following:

(a) Portions of the barchan dunes which bear more or less scattered vegetation, such as dune grasses, *Narras* (*Acanthosicyos horrida*), etc.; these portions are usually situated in the marginal area of the dune systems, or are formed by smaller, undulating grassy dunes in front of the big and barren dunes.

This niche is favoured by a great number of dune Tenebrionids. They are plant-followers (Koch, 1952c) or plant-satellites (Pierre, 1958), as their life, in one way or the other, appears to be connected with the existence of plants. They are not necessarily phytophagous insects but, as opposed to the inhabitants of the barren portion of the dunes, may be best characterized by the name of 'gravitaters', as they are attracted, move or gravitate towards a plant centre. According to the manner in which they react to this milieu, they occur in the Namib dunes in the two following categories.

(α) *Errant plant-followers* (cf. Pl. XIII). These are all those species which, during the active ethological state of daily rhythm, move around between or underneath the plants, and retire into the sand below the plant for the interval of their daily dormant state. A typical example of such an errant plant-follower is *Onymacris plana*. It is a daylight and considerably heliotactic sand-runner of the barchan dunes, living always close to some plant and frequently taking intermittent shelter in the half-shade of this plant during the day, but digging itself into the sand underneath the plant at sunset for the period of its nocturnal dormant state.

Many of the diurnal and also the nocturnal dune Tenebrionids can be placed in this category, such as *Namibomodes*, *Archinamibia*, *Namibismus*, *Arthrochora*, *Ophthalmosis*, *Gyrosis*, *Stips stali* and of the genus *Onymacris* the species *plana*, *lobicollis*, *subelongata*, *rugatipennis* (cf. Pl. XIII), *marginipennis* and *langi*.

(β) *Stationary plant-followers*. The species of this category appear to be more intimately connected with the plant than those of the preceding group. They usually live in gregarious populations in the sand underneath the plant, generally between the roots, and surface from the sand only occasionally, without moving too far away from the plant. In this behaviour they recall the Tenebrionids of the circum-African littoral sand fauna and are all also nocturnal, or permanently 'under-sand' insects. Typical representatives are, for example, *Caenocrypticus deserticus*, *phaleroides* and *peezi*, *Periloma alfkeni*, *Psammogaster malani* and, so far as I was able to observe, also *Dactylocalcar caecus* and probably *Syntyphlus subterraneus*. The early stages of these species, and probably also of those of the preceding group, may belong to these stationary plant-followers.

(b) The barren dunes and vegetationless slope and crest portions of grassy dunes. Until recently the barren sand of the desertic dunes in general, which is devoid of any macro-flora, was believed to be devoid also of all other life, except for bacteria, micro-fungi and micro-algae (cf. Kilian & Feher on the micro-life of the Saharan sands). With the exception of observations which we have carried out in the Namib Desert, there is no mention in literature of this so-called hostile biotope representing in fact an optimal ecological niche for a whole group of Tenebrionids.

The species which have adapted themselves to this extreme biotope may be defined and referred to by the term *ultra-psammophilous* (Koch, 1961), for they no longer depend on active plant life, but just dwell anywhere in the barren wastes of sand, without necessarily being attracted by plants, or gravitating towards any other central object.

To these ultra-psammophilous dune-dwellers belong the most specialized of all Namib Tenebrionids, viz. all *Lepidochora* (cf. Pl. XV), *Cardiosis*, *Tarsosis*, *Anisosis*, *Vernayella*, and of *Onymacris* the species *unguicularis* (cf. Pl. XIII) with its subspecies *polita*, *laeviceps*, *brincki*, *candidipennis* and *bicolor* with its subspecies *marshalli*.

(c) Some greatly specialized genera cannot be assigned to any of the above-mentioned categories, and seem to react to various further ecological niches. *Calognathus chevrolatii*, *Vansonium bushmanicum* **namibense*, *Cerosis hereroensis* and **Uniungulum* **hoeschi*, for example, have been observed to live in barren sand, but under variously different conditions. *Calognathus* and *Vansonium bushmanicum* **namibense* occur in close proximity to the marginal area of the barchan dunes, in wind-blown sand which invades the foot of the big dunes or rocky outcrops and hills; they have never been observed within the barchan dune system, and it seems that they display somewhat petro-psammophilous habits. **Uniungulum* has been discovered in the grassy marginal area of dunes, but does not seem to be attracted by vegetation. Quite a special ecological niche is occupied by *Cerosis*, which we observed regularly within the true, barren barchan dunes, but exclusively in the run-off valleys between the dunes, on a more compact sand of somewhat grit-like granularity.

C. Sandy to gravelly plains, with isolated rocky outcrops and hills

The principal characteristics of this section† are the hard consistency of the soil (sandy, gravelly, rocky or partially covered by blown sand), and the wide extension of flat, low ground. This low ground is almost continuous but considerably constricted by the great expansion of the barchan dunes in the Southern Namib; it is divided by a great number of river-beds in the Northern Namib, and expands right to the coast line in the dune-less southern portion between the Swakop and Huab Rivers.

Although physiographically clearly delimited in the east by the natural borders formed by the escarpments of the highlands (Jaeger),‡ this part is the least sharply defined of the ecological sections of the Namib. The 2000 ft. (or 600 m.) contours, which were accepted as eastern border lines, do not coincide in most cases with the natural faunistical limits. The plains often rise gradually above the 2000 ft. contour, and various enclaves of the highlands, such as isolated hills and portions which have broken away from the escarpment, keep below this contour. Thus, on the one hand a great number of faunistical elements of the highlands

† See parts of the 'Inner Namib' and the 'Outer Namib' of Walter, and 'Vor-Namib' of Gebien, Mertens and others.

‡ Geomorphologically Jaeger includes the whole of the coastal incline in the Namib, as opposed to the highlands delimited by the escarpment in the west.

have expanded far down and westwards on to the low ground of the Namib, while, on the other hand, several Namib elements have penetrated in the midst of the highlands by means of 'river-pockets'.

Generally, however, the true and endemic Namib elements of the low ground are readily recognizable by the fact that they do not occur in the highlands proper, while many highland species descend to the low ground and are frequently met with right at the foot of the barchan dunes (e.g. species of the genera *Renatiella* (cf. Pl. XIV), *Herpiscius*, *Rhammatodes*, *Asphaltesthes*, *Drosochrus*, *Nicandra*, *Psectes*, *Zophosis*, *Stips dohrni* **namibensis*, etc.).

Of typical and endemic Namib forms living on the plains, mention is made here only of all the 'white' *Calosis*, the 'white' *Stenocara eburnea* (cf. Pl. XIV); the genera *Nemanas*, *Microderopsis*, **Carpiella*, *Palpomodes*, *Protodactylus*, together with *Stenocara phalangium* and *velox*, *Stipsostoma sculpta*, *Stips dohrni* **namibensis*, *Gyrosis* **moralesi*, as well as localized species of *Zophosis*, *Stenolamus*, *Lornamus*, *Drosochrina* and *Stizopina*. The ecological niches occupied by these Tenebrionids vary in indefinite ways according to geomorphological and vegetation biotopes.

Ultra-deserticolous tendencies seem to prevail in some species, such as *Stenocara eburnea* and *phalangium*, *Calosis amabilis*, *lundholmi* and *tricolor*, *Gyrosis* **moralesi* and several *Zophosis*, which are not attracted by plants, and pass their dormant phase in the sand or under small pebbles. Deviations from this behaviour may be due to various factors, such as seasonal rhythm, etc. Thus we found large numbers of individuals of *Stenocara eburnea* under *Salsola* plants on the quartz-grit plains between the Omaruru River and the Lagoon-Mountains, while the same species, on the gravelly flats north-east of Rooibank, was observed to be typically errant, and did not take shelter under the scattered *Arthraerna leubnitziae* plants which represented the only vegetation on these otherwise barren plains.

Psammophilous plant-followers are *Stenocara phalangium*, the *Palpomodes* and *Protodactylus*, the two former being errant, the latter almost stationary and also penetrating into the marginal area of dunes in the Porto Alexandre desert.

Typically petrophilous insects are *Microderopsis*, *Rhammatodes*, *Asphaltesthes*, *Lornamus* and many *Drosochrina*; several species of *Rhammatodes* and *Asphaltesthes* show subcavernicolous habits and live in eroded caves or in cracks of rock surfaces. Wind-blown accumulations of dry grass fragments and other detritus are the habitat of **Carpiella*, *Stenolamus* and various *Stizopina* and *Cryptochilini*. Some adelostomoid *Eurychorini* are myrmecophilous, while *Stips dohrni* **namibensis* and *Stipsostoma sculpta* seem to prefer the abandoned burrows of rodents and reptiles.

LIST OF THE SPECIES OF THE SOUTHERN NAMIB

Between Orange and Koichab Rivers Between Koichab and Kuiseb Rivers

MOLURINI

<i>Phanerotomea gibberosulum</i>	<i>Phanerotomea gibberosulum</i>
<i>sericicolle</i>	
<i>imbricatum</i>	
<i>Psammodes diabolica</i> * <i>tactilis</i>	
<i>schultzei</i>	
<i>eberlanzi</i>	
<i>lossowi</i>	<i>Psammodes kuisup</i>
<i>Namibomodes rubra</i>	◦ <i>Namibomodes serrimargo</i>
◦ <i>serrimargo</i>	* <i>zarcoi</i>
	* <i>maculicollis</i>
◦ <i>Brinckia insularis</i>	◦ <i>Brinckia debilis</i>
	* <i>Uniumgulum</i> * <i>hoeschi</i>

Between Orange and Koichab Rivers

Between Koichab and Kuiseb Rivers

Calognathus chevroletii f.t.
chevr. eberlanzi

CALOGNATHINI

Calognathus chevr. eberlanzi

VANSONINI

Vansonium bushmanicum **namibense*

CRYPTOCHILINI

Parapachynotela eberlanzi
Pachynotelus granaticollis
leucimus
namibensis
longipilis
◦*dimorphus* (1)
strigicollis f.t.
comma f.t.
*comma niveus**Pachynotelus strigic. junior**comma damarensis*
albonotatus
albostrigatus
streya
**kuehnelti*
*Fossilochile rufa**Onymacris lobicollis*
laeviceps
unguicularis f.t.
unguic. polita
plana f.t.
plana debilis
rugatipennis

ADESMIINI

Onymacris laeviceps (2)
unguicularis f.t.*plana* f.t.*rugatipennis*
*subelongata**Eustolopus calcaratus*
◦*octoseriatus*
◦*Physosterna cribripes*
◦*Stenocara inaeffectata*
◦*bethanica*
phalangium f.t.
Epiphysa louwrensi◦*Eustolopus octoseriatus* (3)
◦*Physosterna cribripes**Stenocara phalang. rufofemorata* (4)*Cimiciopsis castleae*
◦*Cimicia spinipes*
Stips stali
Arthrochora arenicola
Lepidochora pilosa
diaphana
discoidalis f.t.

eberlanzi f.t.

EURYCHORINI

Stips stali (5)
Arthrochora arenicola (6)*Lepidochora discoidalis* f.t.
*disc. *argentogrisea*
eberlanzi parva
**kahani*
portiStipsostoma sculpta*
Eurychora alaticollis

TENTYRIINI

Archinamibia peezi (6)*Afrinus adamantinus*
namibensis
◦*Asphaltesthes impressipennis*
◦*Rhammatodes aequalipennis*
Derosphaerius humilis◦*Rhammatodes aequalipennis*
Derosphaerius humilis
◦*Cyphostethe tau cavipectus*

Between Orange and Koichab Rivers

Between Koichab and Kuseib Rivers

ZOPHOSINI

*Cardiosis eremita**Cardiosis fairmairei* f.t.
fairmair. namtibensis
*fairmair. freyi**fairmair. luederitzensis**triangulifera* f.t.
triang., reducta°*Tarsosis damarensis*°*Tarsosis damarensis*°*Onychosis gracilipes*°*Onychosis gracilipes**Gyrosis orbicularis**Gyrosis orbicularis***moralesi**Cerosis hereroensis**Cerosis hereroensis* (6)*Hesseosis adamantina**Zophosis solivaga**namibensis**Dactylocalcar caecus* (6)

SCAURINI

*Carchares granulosa**Carchares granulosa*°*macer*°*macer*

PYTHIOPINI

Pythiopus cornutipectus

ONCOTINI

°*Ograbies campi**Hirtograbies namibensis**longipilis*°*Stridigula plamiuscula*

STIZOPINA (OPATRINI)

Parastizopus diehli°*lithopsophilus*°*Parastizopus balneorum**Periloma alfkeni**Nemanis expansicollis**Psammogaster malani**Syntyphlus subterraneus*

STENOLAMINA (OPATRINI)

Stenolamus malacodermus

GONOPINA (PLATYNOTINI)

°*Gonopus tibialis*°*Gonopus tibialis*

PHALERIINI

°*Pachyphaleria capensis*°*Pachyphaleria capensis*

CAENOCRYPTICINI

Caenocrypticus deserticus°*phaleroides*°*Caenocrypticus phaleroides* (6)*peezi*°*Fitzsimonsium cymbium*°*Vernayella noctivaga**ephialtes***pauliani***delabati*

DROSOCHRINA (DROSOCHRINI)

*Nicandra spinulosa**New records:* (1) Also north of the Orange River (Daberas dunes).(2) *Onymacris laeviceps* spreads northwards as far as Gobabeb (also at the Tsauchab River and Sossus Vlei).

(3) Collected also in the dunes near Gobabeb.

(4) Very common also on the grit plains at the southern side of the Kuseib River, near Gobabeb.

(5) *Stips stali* has been collected everywhere on the dunes of the Southern Namib, from about Haalenberg northwards as far as Walvis Bay.(6) Recently the following species were collected also at the Tsauchab River, Sossus Vlei, Gobabeb and Rooibank: *Arthrochora arenicola*, *Archinamibia peezi*, *Cardiosis fairmairei* f.t. and *freyi*, *Cerosis hereroensis*, *Dactylocalcar caecus* and *Caenocrypticus phaleroides*.

LIST OF THE SPECIES OF THE NORTHERN NAMIB

Between Kuiseb and Huab Rivers Between Huab and Cunene Rivers Between Cunene and Coroca Rivers North of Coroca River

MOLURINI

Phanerotomea cordiventre

Phanerotomea dubiosum
argenteofasciatum
Psammodes sellatus subsp.
uriae
°*Synhinba cordiforme*

Palpomodes physoptera f.t.
halophila

Namibomodes serrimargo
Palpomodes physoptera f.t.

°*Synhinba cordiforme*

Palpomodes phys. angolensis

°**Brinckia debilis*

rudebecki
°**Brinckia debilis*

°**Brinckia debilis*
Somaticus welwitschi
°*Ethmus vernayi* f.t.

Somaticus welwitschi

CALOGNATHINI

Calognathus chevrol. atricolor

CRYPTOCHILINI

Pachynotelus machadoi f.t.
machadoi tigrum

Pachynotelus machadoi laevimargo

Pachynotelus herminiferus

lineatus

ADESMIINI

Onymacris marginipennis
subsp. *nigropunctata*
bic. marshalli

Onymacris marginipennis
subsp. *palgravei*

Onymacris marginipennis f.t.

bicolor f.t.
brincki
**visseri*

candidipennis

Onymacris longi

°*Physosterna globosa* f.t.
glob. epiphysoides
glob. scherzi
cribripes

°*Eustolopus octoseriatus*

°*Physosterna cribripes*

°*Physosterna cribripes*

Between Kuiseb and Huab Rivers

Between Huab and Cunene Rivers

Between Cunene and Coroca Rivers

North of Coroca River

ADESMIINI (cont.)

Stenocara brunnipes f.t.
depressa f.t.
eburnea
°*velox*

Stenocara brunn. pluricostata
depr. dissoluta

°*velox*

Stenocara desertica

dilaticornis

dilaticornis

Stenocara machadoi
°*nervosa*
Stenodesia marshalli
°*Metriopus kunenensis karakul*

Stenodesia marshalli
Metriopus kunenensis f.t.
°*Renatiella fettingi*

Stenodesia marshalli
Metriopus kunenensis f.t.

Renatiella gebieni
°*Alogenius robinsoni*
cavifrons semigranulatus
Epiphysa ciliata

°*Alogenius robinsoni*

°*Alogenius robinsoni*

EURYCHORINI

Stips dorsocostata

Stips dorsocostata

°*Stips dohrni* **namibensis*

°*Stips dohrni* **namibensis*

Lepidochora nocturna

°*Eutichus wahlbergi*

°*Eurychora batesi*
°*angolensis*

°*Eurychora batesi*
°*angolensis*

°*Eurychora batesi*
°*angolensis*
Platysemodes benguelensis

Psaryphulum damara

°*Psaryphulum machadoi*

TENTYRIINI

Microderopsis benguelensis
Asphaltesthes complicans
subsp. *laevigatus*

Microderopsis benguelensis (1)

Microderopsis benguelensis

°*Asphaltesthes costatus* f.t.

°*Asphaltesthes afrogermanicus*

Rhammatodes striatulus
speluncarius f.t.
spelunc. mocamedinus
machadoi
oasis
moufleti
carinatus
deserticus
°*quadricollis*

Rhammatodes deserticus

°*Rhammatodes quadricollis*
longicorn. sceletosorae

Between Kuiseb and Huab Rivers	Between Huab and Cunene Rivers	Between Cunene and Coroca Rivers	North of Coroca River
	TENTYRIINI (cont.)		
◦ <i>Rhammatodes aequalipennis</i> ◦ <i>subcostatus</i> ◦ <i>tagenesthoides</i>	◦ <i>tagenesthoides</i> ◦ <i>Gnophota anthr. colpotoides</i> ◦ <i>Rozonia infranotata</i>	◦ <i>Gnophota anthracina</i> f.t. ◦ <i>semirugosa</i> <i>Namibismus castaneus</i>	◦ <i>Gnophota anthracina</i> f.t. ◦ <i>semirugosa</i> <i>Namibismus castaneus</i>
	ZOPHOSINI		
<i>Calosis amabilis</i> f.t. <i>amab. swakopensis</i>	<i>Calosis lundholmi</i> <i>Cardiosis carpi</i> ◦ <i>Tarsosis damarensis</i> <i>Anisosis caudata</i>	<i>Calosis tricolor</i> <i>Cardiosis moufleti</i> <i>Anisosis caudata</i> <i>Ophthalmosis longipes</i> ◦ <i>Onychosis gracilipes</i> <i>Microsis wilhenai</i>	<i>Calosis tricolor</i>
◦ <i>Onychosis gracilipes</i>	◦ <i>Onychosis gracilipes</i>		◦ <i>Microsis transbechuana</i>
◦ <i>Zophosis dorsata</i> <i>deveva</i> <i>gaerdesi</i> <i>damarina</i> <i>mniszzechi</i>	<i>Zophosis saltans</i> ◦ <i>greeni</i> ◦ <i>himba</i> <i>kunenensis</i>	<i>Zophosis braini</i> <i>elongata</i> <i>sexcostata</i>	<i>Zophosis kunenensis</i> <i>braini</i> <i>Zophosis angolensis</i> <i>mocamedina</i> ◦ <i>bebeana</i> <i>trigo</i> <i>striatimargo</i> <i>pubescens</i>
<i>Protodactylus</i> * <i>giessi</i>			

Between Kuiseb and Huab Rivers	Between Huab and Cunene Rivers	Between Cunene and Coroca Rivers	North of Coroca River
	ZOPHOSINI (cont.)		
	<i>Protodactylus</i> * <i>sanctae-mariae</i>		<i>Protodactylus opticus</i>
	SCAURINI		
* <i>Carpiella</i> * <i>latisterna</i> ◦ <i>Carchares macer</i> ◦ <i>Herpiscius bisbicostratus</i>	◦ <i>Carchares macer</i>		<i>Herpiscius robinsoni</i>
	STIZOPINA (OPATRINI)		
◦ <i>Parastizopus balneorum</i>			◦ <i>Stizopus laticollis</i>
	OPATRINA (OPATRINI)		
	◦ <i>Ammidium namibense</i>	◦ <i>Ammidium namibense</i>	◦ <i>Ammidium namibense</i>
<i>Gonocephalum kolbei</i>	STENOLAMINA (OPATRINI)		
	<i>Stenolamus brincki</i>		<i>Stenolamus machadoi</i> <i>filum</i> <i>deserticus</i>
	GONOPINA (PLATYNOTINI)		
◦ <i>Gonopus tibialis</i> <i>pliciventris</i>	◦ <i>Gonopus tibialis</i>	◦ <i>Gonopus tibialis</i>	◦ <i>Gonopus tibialis</i>
	LITOBORINI		
	CAENOCRYPTICINI		
	◦ <i>Caenocrypticus phaleroides</i>		◦ <i>Lornamus dividiopsis</i>
◦ <i>Lornamus damara</i>		◦ <i>Vernayella noctivaga</i>	
	DROSOCHRINA (DROSOCHRINI)		
<i>Drosochrus vernayanus</i> <i>desolatus</i>	<i>Nicandra desertica</i>		◦ <i>Drosochrus crenulatus</i>
◦ <i>Nicandra michaelsemi</i> <i>Diestecopus histrio</i> <i>gracilipes</i>		<i>Diestecopus martinsi</i>	<i>Diestecopus martinsi</i>

New records. (1) Recently we have collected *Microderopsis benguelensis* also in the area between the Kuiseb and the Huab Rivers, where it seems

widely spread (Cape Cross, Gobabeb, Rooibank, *Welwitschia*-plain in Game Reserve no. III, etc.).

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- Adesmia* Fischer, 1822 (Gebien, 1937; Koch, 1944-48)
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 STENOSINI Lacordaire, 1859 (Koch, 1940, 1943)
Stips Koch, 1950b (Koch, 1952a; Westwood, 1837; Haag, 1875c; Gebien, 1920)
cassidoides Gebien, 1920 (Koch, 1952a)
dorsocostata Fairmaire, 1902 (Gebien, 1920; Koch, 1952a)
gebieni Hesse, 1935 (Koch, 1952a)
stali Haag, 1875c (Koch, 1952a)
Stipsostoma Koch, 1952a (Brown, 1958)
sculpta Gebien, 1920 (Koch, 1952a; Brown, 1958)
 STIZOPINA Koch, 1956 (Gebien, 1938)
Stizopus Erichson, 1843 (Mulsant & Rey, 1859; Gebien, 1938; Koch, 1956)
laticollis Erichson, 1843 (Mulsant & Rey, 1859)
Storthocnemis Karsch, 1881 (Gridelli, 1933; Koch, 1937)
 STRONGYLINI Lacordaire, 1859 (Gebien, 1942-44)
Symphochora Koch, 1952a.
Synhimba Koch, 1952d
cordiforme Haag, 1871 (Koch, 1952d)
Syntyphlus Koch, 1953h (Koch, 1956)
subterraneus Koch, 1953h

Tarsocnodes Gebien, 1920 (Koch, 1952d)
Tarsosis Gebien, 1920 (Koch, 1958)
damarensis Peringuey, 1886 (Gebien, 1920, 1938; Koch, 1952c, 1958)
 TENTYRIINA Koch, 1955a (Solier, 1835; Gebien, 1937)
 TENTYRIINI Koch, 1955a (Koch, 1950a)
Thorictophasis Koch, 1950c
Trachyscelis Latreille, 1809 (Gebien, 1938-42; Koch, 1953g, 1960a)

 VANSONIINI Koch, 1955a
Vansonium Koch, 1950a
bushmanicum Koch, 1950a (Koch, 1955a)
Vernayella Koch, 1958
ephialtes Koch, 1958
noctivaga Koch, 1958

Zambesmia Koch, 1944-48
 ZOPHOSINA Koch, 1958
 ZOPHOSINI Solier, 1834 (Deyrolle, 1867; Chatanay, 1916, 1921; Gebien, 1920;
 Koch, 1958)

- Zophosis* Latreille, 1802 (Solier, 1834; Deyrolle, 1867; Reitter, 1916*b*; Chatanay, 1916; Gebien, 1920; Chatanay, 1921; Gebien, 1937; Koch, 1958)
angolensis Erichson, 1843 (Deyrolle, 1867; Chatanay, 1921; Koch, 1958)
bebeana Koch, 1958
braini Koch, 1958
damarina Peringuey, 1908 (Gebien, 1920; Chatanay, 1921; Koch, 1958)
dorsata Peringuey, 1892 (Chatanay, 1921)
elongata Deyrolle, 1867 (Chatanay, 1921; Koch, 1958)
greeni Koch, 1958
himba Koch, 1958
kunenensis Koch, 1958
mniszehi Deyrolle, 1867 (Chatanay, 1921)
mocamedina Koch, 1958
namibensis Peringuey, 1908 (Chatanay, 1921)
pubescens Chatanay, 1914 (Chatanay, 1921; Koch, 1958)
saltans Koch, 1958
sexcostata Deyrolle, 1867 (Chatanay, 1921; Koch, 1958)
solivaga Koch, 1958
striatimargo Koch, 1958
trigo Koch, 1958
viridilimbata Chobaut, 1899 (Reitter, 1916*b*; Koch, 1937)

REFERENCES

- ACOCKS, J. H. (1953). Veld types of South Africa. *Dep. Agric. Bot. Surv. Mem.* 28, 192 pp., 6 maps.
 ALLARD, E. (1885). Classification des Adesmüdes et Mégagénides. *Ann. Soc. ent. Fr.* (6), 5, 155-208.
 ANTOINE, M. (1941). Notes d'Entomologie Marocaine. XXXII. Les *Litoborinae* du Maroc. *Bull. Soc. Sci. Nat. Maroc*, 21, 19-52, 20 figs.
 AZZAROLI, A. (1957). Missione geologica in Migiurtinia. *La Riv. Sci., Roma*, 27, 299-346, 39 figs.
 BATES, F. (1872). Notes on Heteromera and descriptions of new genera and species. *Ent. Mag.* 9, 133-5.
 BLANCHARD, E. (1845). *Hist. Nat. Ins.* 4.
 BREME, F. DE (1840). Description de deux nouveaux Mélasomes du genre *Adesmia*. *Rev. Zool.* 3, 112-13.
 BREME, F. DE (1841). *Adesmia candidipennis* et *marginipennis*, espèces nouvelles. *Mag. Zool.* 1, pls. 60 and 61.
 BRINCK, P. (1956-57). The food factor in animal desert life. *B. Hanström, Zool. Pap., Lund*, pp. 120-37, 8 figs.
 BROWN, H. D. (1958). A new species of *Stipsostoma*, with a key to the species and distribution map of the tribe Eurychorini in Southern Africa. *J. Ent. Soc. S. Afr.* 21, 415-22, 10 figs.
 CASEY, T. L. (1907). A revision of the American components of the Tenebrionid subfamily Tentyriinae. *Proc. Wash. Acad. Sci.* 9, 275-522.
 CHATANAY, J. (1916). Revision des *Zophosis* de l'Est de l'Afrique. *Ann. Soc. ent. Fr.* 85, 503-624, 130 figs.
 CHATANAY, J. (1921). Coleoptera, Fam. Tenebrionidae, Subf. Zophosinae. *Gen. Insect.* 176, 1-50, 2 pls.
 CHEVROLAT, A. (1878). Diagnoses de *Phaleria* nouvelles. *Bull. Soc. ent. Belg.* pp. 247-49.
 CHOBAUT, F. (1899). *Zophosis viridilimbata*. *Bull. Soc. ent. Fr.*, 409.
 DEYROLLE, A. (1867). Monographie de la tribu des Zophosites. *Ann. Soc. ent. Fr.* (4), 7, 73-248, 4 pls.
 DROUHIN, G. (1953). The problem of water resources in North West Africa. *UNESCO, Arid Zone Hydrology*, pp. 9-41.
 ERICHSON, W. F. (1843). Beitrag zur Insekten-Fauna von Angola. *Arch. Nat.* 9, 199-267.

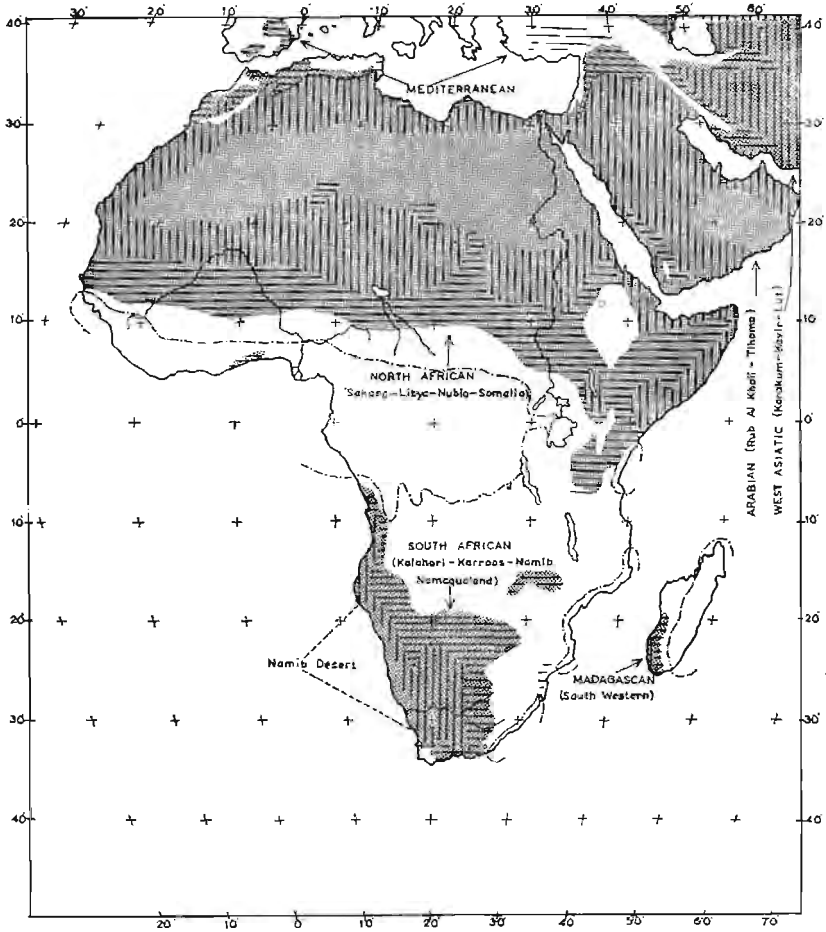
- ESPANOL, F. (1944). Nuevos datos para el conocimiento de los Tenebrionidos del Sahara Espanol. *Eos*, 20, 7-30, 4 figs.
- ESPANOL, F. (1945). Nuevos comentarios sistematicos sobre la subfamilia Opatrinae REITT. con la descripcion de un nuevo representante del Sahara Espanol. *Eos*, 20, 213-32, 6 pls.
- ESPANOL, F. (1956). Nuevos Opatrini de Marruecos y del Sahara Atlantico. *Publ. Univ. Barcelona, Facult. Cienc.* pp. 1-12, 2 figs.
- ESPANOL, F. (1958). Sobre las principales divisiones propuestas por KOCH para los Opatrinae Pan-Africanos. *Eos*, 34, 101-16.
- FAIRMAIRE, L. (1849). Description du genre *Diphyrrhynchus*. *Rev. Zool.* p. 445.
- FAIRMAIRE, L. (1888). Énumération des Coléoptères recueillies par M. le Dr Hans Schinz dans le sud de l'Afrique. *Ann. Soc. ent. Fr.* (6), 8, 173-202.
- FAIRMAIRE, L. (1891). Deux Coléoptères nouveaux de la Cafrerie. *Bull. Soc. ent. Fr.* 89-90.
- FAIRMAIRE, L. (1902). Coléoptères nouveaux de San Thomé et du Benguela. *Bull. Soc. ent. Fr.* pp. 134-6.
- FERREIRA, M. C. (1951). Sobre uma oferta valiosa de coleópteros tenebrionideos feita pelo Transvaal Museum ao Museu Dr Alvaro de Castro. *Bol. Soc. Est. Mocamb.* 72, 1-24, 11 figs.
- FERREIRA, M. C. (1953a). Morfologia dos Coleópteros Africanos. I. Tenebrionidae (Opatrini, Adesmiini, Eurychorini e Pycnocerini). *Bol. Soc. Est. Mocamb.* 81, 1-33, 83 figs.
- FERREIRA, M. C. (1953b). Morfologia dos Coleópteros Africanos. I. Tenebrionidae (Dactylocalcarini e Molurini). *An. Fac. Cienc. Porto*, 37, 78-118, 87 figs.
- FERREIRA, M. C. (1954). Morfologia dos Coleópteros Africanos. I. Tenebrionidae (Zophosini, Epitragini, Epiphysini). *Bol. Soc. Est. Mocamb.* 83, 1-29, 45 figs.
- FERREIRA, M. C. (1955a). Morfologia dos Coleópteros Africanos. I. Tenebrionidae (Gonopini, Asidini, Cossiphini, Rhyssopaussini, Eurychorini, Cryptochilini, Phaleriini, Pediniini, Adesmiini, Tenebrionini, Meracanthini, Amarygmini, Tentyriini, Calognathini, Sepidiini, Ulomini (Strongyliini). *Bol. Soc. Est. Mocamb.* 90, 97-133, 104 figs.
- FERREIRA, M. C. (1955b). Elementos de morfologia externa dos Coleópteros. *Bol. Inst. Angola*, 6, 43-77, 102 figs., 2 pls.
- FROMMURZE, H. F. (1953). Hydrological research in arid and semi-arid areas in the Union of South Africa and Angola. *UNESCO, Arid Zone Hydrology*, pp. 58-77, 3 maps.
- GEBIEN, H. (1910). *Coleopterorum Catalogus, Tenebrionidae. I*, 15, 166 pp. Berlin: W. Junk.
- GEBIEN, H. (1920). Käfer aus der Familie Tenebrionidae, gesammelt auf der 'Hamburger deutsch-südwestafrikanischen Studienreise 1911'. *Abh. Auslandskd., Univ. Hamburg*, 5, no. 2, 168 pp., 6 maps, 69 figs., 2 pls.
- GEBIEN, H. (1922). The Percy Sladen Trust Expedition to the Indian Ocean. V. Coleoptera, Heteromera: Tenebrionidae. *Trans. Linn. Soc. Lond.* 28, 261-324, 22 figs., 1 pl.
- GEBIEN, H. (1937). Katalog der Tenebrioniden. I. Teil. *Pubbl. Mus. Pietro Rossi, Duino*, 2, 381 pp.
- GEBIEN, H. (1937). Über neue Tenebrioniden Ostafrikas. *Atti Mus. Trieste*, XIV, 21-56, 5 figs.
- GEBIEN, H. (1938). Die Tenebrioniden der Namibwüste in Südwestafrika. *Abh. nat. Ver. Bremen*, 30, 20-107, 30 figs.
- GEBIEN, H. (1938-42). Katalog der Tenebrioniden. II. Teil. *Mitt. Münchn. ent. Ges.* 28-32, 373 pp.
- GEBIEN, H. (1939). Körperbau und Lebensweise der Wüstentenebrioniden. *VII. Int. Kongr. Ent. Berl.*, 1, 118-32, 8 figs.
- GEBIEN, H. (1942-44). Katalog der Tenebrioniden. III. Teil. *Mitt. Münchn. Ent. Ges.* 32-34, 122 pp.
- GRIDELLI, E. (1930). Risultati Zoologici della Missione inviata della R. Società Geografica Italiana per l'esplorazione dell'oasi di Giarabub.—Coleotteri. *Ann. Mus. Genova*, 54, 485 pp.

- GRIDELLI, E. (1933). Spedizione scientifica dell'oasi di Cufra. Coleotteri. *Ann. Mus. Genova*, 56, 155-258.
- GRIDELLI, E. (1945). Coleotteri dell'Africa Orientale. 14. Appunti per una monografia delle specie etiopiche del genere *Gonocephalum* SOL. *Atti Mus. Trieste*, 16, 1-28.
- GRIDELLI, E. (1948). Coleotteri dell'Africa tropicale. 17. Ulteriori appunti per una monografia delle specie africane del genere *Gonocephalum* Sol. *Atti Mus. Trieste*, 17, 1-56.
- GRIDELLI, E. (1953). Catalogo ragionato delle specie di Coleotteri Tenebrionidi dell'Arabia. *Atti Mus. Trieste*, 19, 1-70, 1 pl.
- GUERIN-MENEVILLE, F. E. (1836). Calognathe. *Mag. Zool. Ins.* 9, 1-4, pl. 172.
- GUERIN-MENEVILLE, F. E. (1843). Notes sur quelques Coléoptères mélasomes. *Rev. Zool.* 261.
- GUERIN-MENEVILLE, F. E. (1846). *Ammobius*. *Icon. règne anim.* 121.
- HAAG, G. (1871). Revision der Familie der Moluriden. *Col. Hefte*, 7, 24-111.
- HAAG, G. (1872). Monographie der Cryptochiliden. *Berl. ent. Z.* 16, 273-313.
- HAAG, G. (1873). Beiträge zur Familie der Tenebrioniden. I. *Col. Hefte*, 11, 1-48.
- HAAG, G. (1875a). Beiträge zur Familie der Tenebrioniden. V. *Col. Hefte*, 14, 67-92.
- HAAG, G. (1875b). Beiträge zur näheren Kenntnis einiger Gruppen der Familie der Tenebrioniden. I. Adesmiiden. *Dtsch. ent. Z.* 19, no. 7, 1-44.
- HAAG, G. (1875c). Monographie der Eurychoriden. *Dtsch. ent. Z.* 19, no. 5, 359-428.
- HAAG, G. (1877). Zwei neue Adesmiiden-Arten. *Dtsch. ent. Z.* 21, 283-4.
- HAAG, G. (1878). Beschreibung neuer Arten von Heteromeren als Nachtrag zu Monographien. *Mitt. Münchn. ent. Ver.* pp. 77-95.
- HAAG, G. (1879). Fernere Nachträge zu den Heteromeren-Monographien der Moluriden, Eurychoriden und Adesmiiden. *Dtsch. ent. Z.* 23, 289-96.
- HESSE, A. J. (1935). Scientific results Vernay-Lang Kalahari Expedition. Tenebrionidae. *Ann. Transv. Mus.* 16, 525-79, 19 figs.
- HOPE, F. W. (1837-40). *The Coleopterist's Manual*, 1-3. London.
- JAEGER, F. (1921). Beiträge zur Landeskunde von Südwestafrika. II. Landschaften des nördlichen Südwestafrika, 136 pp., 16 figs. Berlin.
- JEANNEL, R. (1946). *Introduction à l'entomologie. III. Paléontologie et peuplement de la terre*, 101 pp., 24 figs., 13 pls., 1 map. Paris.
- KAISER, E. (1926). *Die Diamantenwüste Südwest-Afrikas*, 2 vols., 856 pp., 158 figs., 56 pls., 13 maps, 32 stereo-photos. Berlin.
- KIRBY, W. (1818). A century of insects, including several new genera. *Trans. Linn. Soc., Lond.* 12, 375-453.
- KOCH, C. (1935). Wiss. Erg. Ent. Exped. Della Torre e Tasso, Ägypten und Sinai. *Bull. Soc. R. Ent. Egypte*, pp. 1-111.
- KOCH, C. (1937). Wiss. Erg. Ent. Exped. Della Torre e Tasso, Libyen. *Pubbl. Museo Pietro Rossi, Duino*, 2, 1-220, 20 figs.
- KOCH, C. (1940). Phylogenetische, biogeographische und systematische Studien über ungeflügelte Tenebrioniden. I. *Mitt. Münchn. ent. Ges.* 30, 254-337, 8 figs.
- KOCH, C. (1941). Phylogenetische, biogeographische und systematische Studien über ungeflügelte Tenebrioniden. III. *Mitt. Münchn. ent. Ges.* 31, 252-314, 12 figs., 2 pls.
- KOCH, C. (1943). Phylogenetische, biogeographische und systematische Studien über ungeflügelte Tenebrioniden. IV. *Mitt. Münchn. ent. Ges.* 33, 479-597, 13 figs.
- KOCH, C. (1944a). Übersicht über die mit der Gattung *Gnophota* verwandten südafrikanischen Tentyriini. *Mitt. Schweiz. ent. Ges.* 19, 157-168, 7 figs.
- KOCH, C. (1944b). Die Tenebrioniden Kretas. *Mitt. Münchn. ent. Ges.* 34, 255-363, 21 figs., 12 pls.
- KOCH, C. (1944-48). Die Adesmiini der tropischen und subtropischen Savannen Afrikas. *Rev. Zool. Bot. Afr., Bruxelles*, 38, 139-91, 133-201, 18 figs., 4 pls.





- KOCH, C. (1950a). S.A. Tenebrionidae. I. Account of the Tenebrionidae collected on the University of California-Transvaal Museum Expedition. *Ann. Transv. Mus.* 21, 272-367, 18 pls.
- KOCH, C. (1950b). Proposed change of African generic names in the family of Tenebrionidae. *Entomologist*, 83, 66-8.
- KOCH, C. (1950c). S.A. Tenebrionidae. V. Contribution to the knowledge of the *Caedius*-group of Opatrini and the Crypticini from South of the Sahara. *Mem. Mus. Alv. Castro*, 1, 35-90, 7 pls.
- KOCH, C. (1951a). S.A. Tenebrionidae. VII. Preliminary notes on the South African Adesmiini. *Ann. Transv. Mus.*, 21, 385-417, 3 figs., 2 pls.
- KOCH, C. (1951b). S.A. Tenebrionidae. IX. *Arturium* nov. gen. Molurinatorum, ex aff. *Phrynocolus*. *Atti Soc. it. Sci. Nat.* xc, 81-96, 2 figs., 1 pl.
- KOCH, C. (1952a). S.A. Tenebrionidae. VIII. Materials for a monographic study on Eurychorini. *Bull. Soc. Fouad Ent.* 36, 1-125, 101 figs., 13 pls., 3 maps.
- KOCH, C. (1952b). S.A. Tenebrionidae. VI. The Angolan Cryptochilini. *Publ. Cult. Diamang*, 15, 37-90, 48 figs., 1 map.
- KOCH, C. (1952c). S.A. Tenebrionidae. XII. Supplementary notes to preliminary articles nos. I, III, V and VIII. *Ann. Transv. Mus.* 22, 79-196, 42 figs., 11 pls., 3 maps.
- KOCH, C. (1952d). S.A. Tenebrionidae. XIII. Vorstudien zu einer Monographie der Molurini. *Ent. Arb. Mus. Frey*, 3, 214-349, 3 figs., 5 pls.
- KOCH, C. (1953a). S.A. Tenebrionidae. XI. New Epitragini and Cryptochilini from the British Museum. *Proc. R. Ent. Soc.* 22, 155-163, 14 figs.
- KOCH, C. (1953b). S.A. Tenebrionidae. XXIII. *Heterocheira*, an Australian genus new to the African continent. *Bol. Soc. Est. Mocamb.* 81, 173-82, 3 figs.
- KOCH, C. (1953c). S.A. Tenebrionidae. XXIV. New Portuguese East African species collected by Dr A. J. Barbosa. *Rev. Faculd. Cienc. Lisboa*, 2, III, 239-310, 25 figs., 1 pl., 4 maps.
- KOCH, C. (1953d). S.A. Tenebrionidae. XVI. Vorläufige Beschreibungen neuer Tenebrioniden des Südlichen Afrikas aus der Sammlung der Universität Lund. *Lunds Univ. Årsskr.* 2, no. 49, 1-24, 4 figs.
- KOCH, C. (1953e). S.A. Tenebrionidae. XV. Revision der Oncotini. *Ark. Zool., Stockholm*, 7, 1-96, 41 figs., 4 pls., 3 maps.
- KOCH, C. (1953f). S.A. Tenebrionidae. XVII. Contribution to the fauna of Angola. *Publ. Cult. Diamang*, 16, 61-96, 28 figs., 1 map.
- KOCH, C. (1953g). S.A. Tenebrionidae. XXII. *Trachyscelis esquivelei* sp.n., the first Southern African representative of the tribe Trachyscelini. *Bol. Soc. Est. Mocamb.* 80, 105-113, 3 figs.
- KOCH, C. (1953h). S.A. Tenebrionidae. XXI. On some new endemic Opatrinae from the Namib Desert. *Ann. Transv. Mus.* 22, 231-52, 8 figs.
- KOCH, C. (1955a). Monograph of the Tenebrionidae of Southern Africa. Vol. 1: Tentyriinae, Molurini, Trachynotina, *Somaticus* Hope. *Transv. Mus. Mem.* 7, 242 pp., 158 figs., 24 pls., 2 maps.
- KOCH, C. (1955b). S.A. Tenebrionidae. XXV. New, forgotten or palaeartic genera and species of Opatrinae. *Ann. Transv. Mus.* 22, 419-76, 64 figs., 3 pls.
- KOCH, C. (1955c). S.A. Tenebrionidae. XVIII. A new genus of Crypticini from Namaqualand. *Ann. Transv. Mus.* 22, 415-18, 1 fig.
- KOCH, C. (1955d). The fauna of the Namib desert. *Bull. Transv. Mus.* 2, 4-5, 1 fig.
- KOCH, C. (1956). II. Tenebrionidae, Opatrinae: First part, (Platynotini, Litorborini and Loensini). *Publ. Parc Nat. Upemba, Bruxelles*, 40, 472 pp., 282 figs., 35 pls., 8 maps.
- KOCH, C. (1957a). Angaben über Verbreitung und Lebensweise der 'weissen Wüstentenebrioniden'. In KÜHNELT, S.B. *Öst. Akad. Wiss., math.-nat.*, 1, 166, 108-12.
- KOCH, C. (1957b). S.A. Tenebrionidae. XXXV. Two new Cryptochilini from Little Namaqualand. *Ann. Transv. Mus.* 23, 103-8, 1 pl.
- KOCH, C. (1958). Tenebrionidae of Angola. *Publ. Cult. Diamang*, 39, 231 pp., 195 figs., 43 pls., 3 maps.

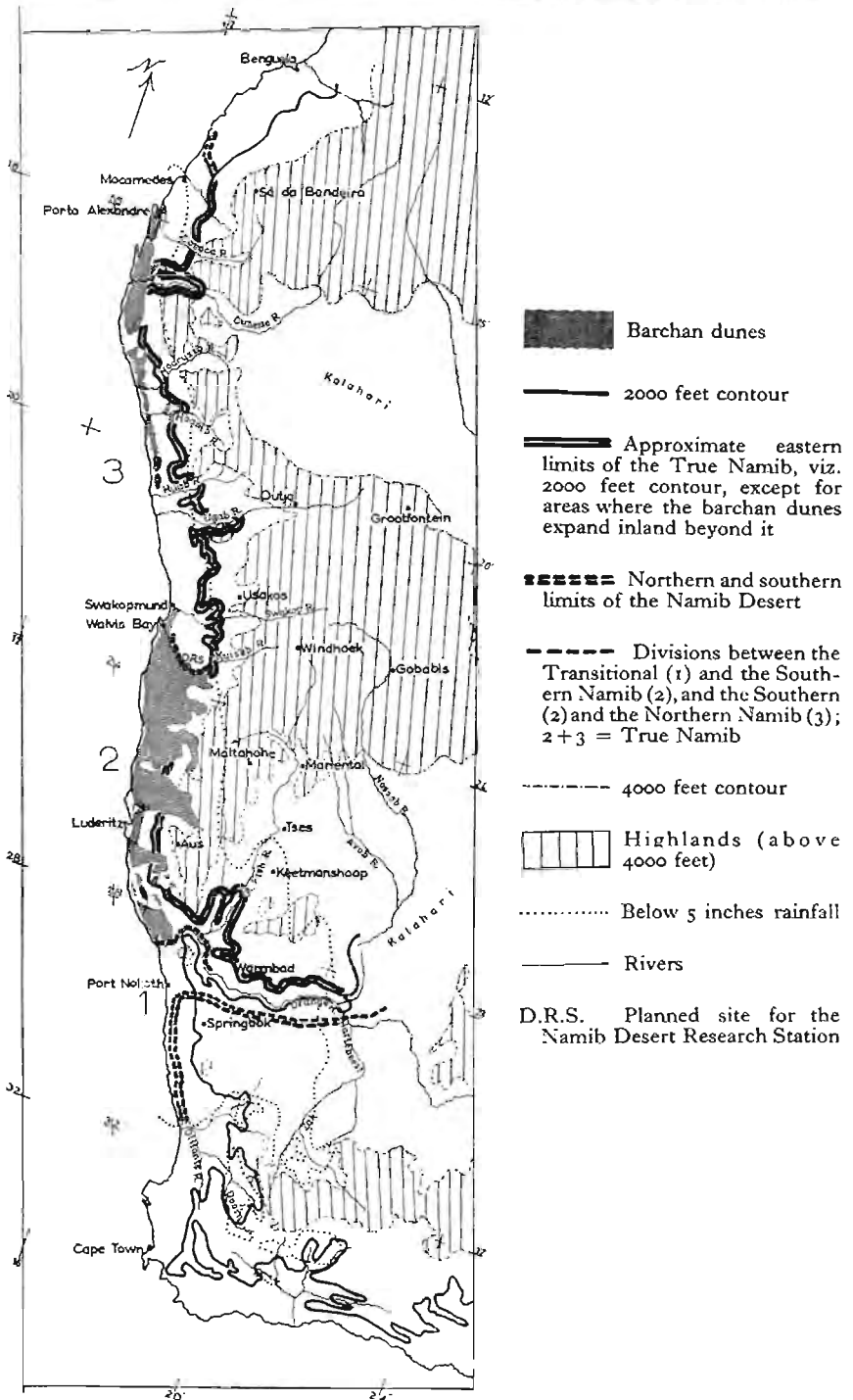
- KOCH, C. (1959a). S.A. Tenebrionidae. XXVIII. On a new faunistical link between the African continent and the Cape Verde Islands (*Ammidium* Erichson). *Nov. Taxa Ent., Lourenco Marques*, 19, 15 pp., 4 figs., 1 pl.
- KOCH, C. (1959b). Erster taxonomischer Beitrag zur Kenntnis der Tenebrioniden Somalias. *Ent. Arb. Mus. Frey*, pp. 568-96, 9 figs., 1 map.
- KOCH, C. (1959c). Die Namibdünen und ihre Tierwelt. 'Der Kreis', Windhoek, 6, pp. 198-200, 1 fig., 1 pl.
- KOCH, C. (1960a). Zweiter taxonomischer Beitrag zur Kenntnis der Tenebrioniden Somalias. *Ent. Arb. Mus. Frey*, 11, 325-414, 31 figs., 1 map, 1 pl.
- KOCH, C. (1960b). The Tenebrionid beetles of South West Africa. *S.A. Mus. Ass., Durban*, 7, 73-85, 3 figs., 1 map.
- KOCH, C. (1961). Some aspects of abundant life in the vegetationless sand of the Namib dunes: Positive psammotropism in Tenebrionid beetles. *J. S.W.A. Scient. Soc.* xv, 8-34, 77-92, 8 figs., 2 maps, 10 pls.
- KOCH, C. (1962). The Tenebrionidae of Southern Africa. XXXII. New psammophilous species from the Namib Desert. *Ann. Transv. Mus.* 24, 107-159, 4 figs. 11 pls.
- KOCHER, L. (1958). Catalogue commenté des Coléoptères du Maroc. *Trav. Inst. Sc. Chérif. Zool.* 12, 185 pp.
- KÜHNELT, W. (1957). Weiss als Strukturfarbe bei Wüstentenebrioniden. *S.B. Ost. Akad. Wiss., math.-nat.*, 1, 166, 103-12, 1 pl.
- KULZER, H. (1949). Drei neue Tenebrioniden-Arten aus Afrika und Südamerika. *Mitt. Münchn. Ent. Ges.* 35-39, 302-6, 1 fig.
- KULZER, H. (1959). Neue Tenebrioniden aus Südamerika. *Ent. Arb. Mus. Frey*, 10, 523-67, 6 figs., 2 pls.
- KUNTZEN, H. (1914-16). Kritische Bemerkungen und Beiträge zur Kenntnis der Adesminen des tropischen und südlichen Afrika. *Arch. Nat.* 81, A, 7, 129-55.
- LACORDAIRE, T. (1859). *Genera des Coléoptères. Ténébrionides*, 400 pp. Paris.
- LAPORTE DE CASTELNAU, F. L. (1840). *Histoire Naturelle des Crustacés et des Insectes*, 3 vols. Paris.
- LATREILLE, P. A. (1829). Les Crustacés, les Arachnides et les Insectes. *Buffon's Histoire Naturelle, Paris*, ed. 2, vol. v.
- LOGAN, R. F. (1960). The Central Namib Desert. *Publ. Nat. Acad. Sci. Wash.* no. 758, 162 pp., 15 figs.
- MÄKLIN, F. W. (1863). Die Gattung *Praogena* und deren Repräsentanten. *Act. Soc. Fenn.* 7, 557-80.
- MARCUZZI, G. (1956). Contribucion al estudio de la ecologia del medio xerofilo Venezolano. *Publ. Cult. Univ. Andes, Merida*, 53, 42 pp.
- MARCUZZI, G. (1960). Rapporti tra equilibrio idrico e ambiente nei Coleotteri Tenebrionidi. *Arch. Zool. Ital.* 45, 325-42.
- MEIGS, P. (1953). World distribution of arid and semi-arid homoclimates. *UNESCO, Arid Zone Hydrology*, pp. 203-10, 2 maps.
- MELLINI, E. (1956). Aspetti estivi della entomofauna dello Uádi Sofeggin e suoi affluenti. *Boll. Ist. Ent. Univ. Bologna*, 21, 243-76, 13 figs., 6 pls.
- MERTENS, R. (1955). Die Amphibien und Reptilien Südwestafrikas. *Abh. Senckenb. nat. Ges.* 490, 122 pp., 1 map, 24 pls.
- MONOD, T. (1942). In KACHKAROV & KOROVINE, *La vie dans les déserts*, 361 pp., 63 figs., 32 pls. Paris.
- MONOD, T. (1957). Les grandes divisions chorologiques de l'Afrique. *Publ. C.S.A.* 24, 146 pp., 2 pls., 1 map.
- MULSANT, M. E. (1854). *Histoire Naturelle des Coléoptères de France*. Latigènes, 396 pp. Paris.
- MULSANT, M. E. & REY, C. (1859). Essai d'une division des derniers Mélasomes. Opatrites I. *Mém. Ac. Imp. Lyon*, 9.
- MULSANT, M. E. & REY, C. (1860). Essai d'une division des derniers Mélasomes. Opatrites II. *Mém. Ac. Imp. Lyon*, 10.
- PASCOE, E. P. (1887). *Ann. Mag. Nat. Hist.* (5), 20, 12.
- PERINGUEY, L. (1885). First contribution to the South African coleopterous fauna. *Trans. S.A. Phil. Soc.* 3, 74-149, 4 pls.

- PERINGUEY, L. (1886). Second contribution to the South African coleopterous fauna. *Trans. S.A. Phil. Soc.* 4, 67-190, 4 pls.
- PERINGUEY, L. (1892). Third contribution to the South African coleopterous fauna. *Trans. S.A. Phil. Soc.* 6, 1-94.
- PERINGUEY, L. (1899). Fifth contribution to the South African coleopterous fauna. *Ann. S.A. Mus.* 1, 240-330, 2 pls.
- PERINGUEY, L. (1904). Sixth contribution to the South African coleopterous fauna. *Ann. S.A. Mus.* 3, 167-300, 1 pl.
- PERINGUEY, L. (1908). Zool. u. anthropol. Erg. einer Forschungsreise im westl. u. zentr. Südafrika, ausgeführt von Dr L. Schultze. Coleoptera, Tenebrionidae u. Curculionidae. *Denkschr. med.-nat. Ges. Jena*, 13, 393-424.
- PEYERIMHOFF, P. (1931). Mission Scientifique du Hoggar. Coléoptères. *Mém. Soc. Hist. Nat. Alger*, 172 pp.
- PIC, M. (1912). Coléoptères nouveaux exotiques ou peu connus. *L'Echange*, 28, 29-32.
- PIC, M. (1925). Nouveautés diverses. *Mél. exot.-ent.* 44, 1-32.
- PIERRE, F. (1958). Ecologie et peuplement entomologique des sables vifs du Sahara nord-occidental. *Publ. Centr. Rech. Sci. Biol., Paris*, 1, 332 pp., 140 figs., 16 pls.
- REITTER, E. (1914). Bestimmungstabelle europäischer Coleopteren. 72. Scurini und Sepidiini. *Dtsch. Ent. Z.* 4, 369-92.
- REITTER, E. (1916a). Bestimmungs-Tabelle europäischer Coleopteren. Adesmiini. *Wien. Ent. Z.* 35, 31 pp.
- REITTER, E. (1916b). Bestimmungstabelle der Tenebrioniden-Unterfamilie Zophosini aus der paläarktischen Fauna. *Wien. Ent. Z.* 35, 89-99.
- SCHULTZE, L. (1907). *Aus Namaland und Kalahari*, 752 pp., 286 figs., 25 pls., 1 map. Jena.
- SCORTECCI, G. (1940). Biologia Sahariana. *Napoli*, 205 pp., 103 pls.
- SEIDLITZ, G. v. (1893-98). *Naturgeschichte der Insekten Deutschlands. Tenebrionidae*, pp. 201-800. Berlin.
- SIMAİKA, Y. M. (1953). Research in hydrology and fluid mechanics and development of underground water in the arid regions of North-east Africa. *UNESCO, Arid Zone Hydrology*, pp. 42-57, figs., 1 map.
- SOLIER, M. (1835). Essai d'une division des Coléoptères Hétéromères. *Ann. Soc. Ent. Fr.*, 7, 1-199.
- SOLIER, M. (1843). Essai sur les Collaptérides de la tribu des Molurites. *Mem. Ac. Sc. Turin*, 7, no. 2, 1-127, 4 pls.
- SOLIER, M. (1845). *Essai sur les Collaptérides de la tribu des Blapsides*, 224 pp., 12 pls. Turin.
- STRAND, E. (1935). *Miscellanea nomenclatorica zoologica et palaeontologica. VII. Fol. zool. hydrobiol. Riga*, 7, 300-6.
- THUNBERG, A. (1791). *Eurychora. Nov. Ins. Spec.*, 116.
- WALTER, H. (1937). Die ökologischen Verhältnisse in der Namib-Nebelwüste. *Jb. wiss. Bot., Lpz.*, 84, 58-222, 30 figs.
- WELLINGTON, J. H. (1955). *Southern Africa, a Geographic Study*, 528 pp., 96 figs., 50 pls., 4 maps. Cambridge University Press.
- WESTWOOD, J. O. (1837). Description of *Steira costata*. *Mag. Zool.* 7, Cl. IX, no. 176.
- WESTWOOD, J. O. (1889). In Frank OATE'S *Matabele Land*, appendix, IV. Entomology, pp. 338-89, 5 pls.



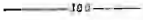







Map 1. Distribution of arid homoclimates in Africa. (After Meigs; Monod, 1957.)

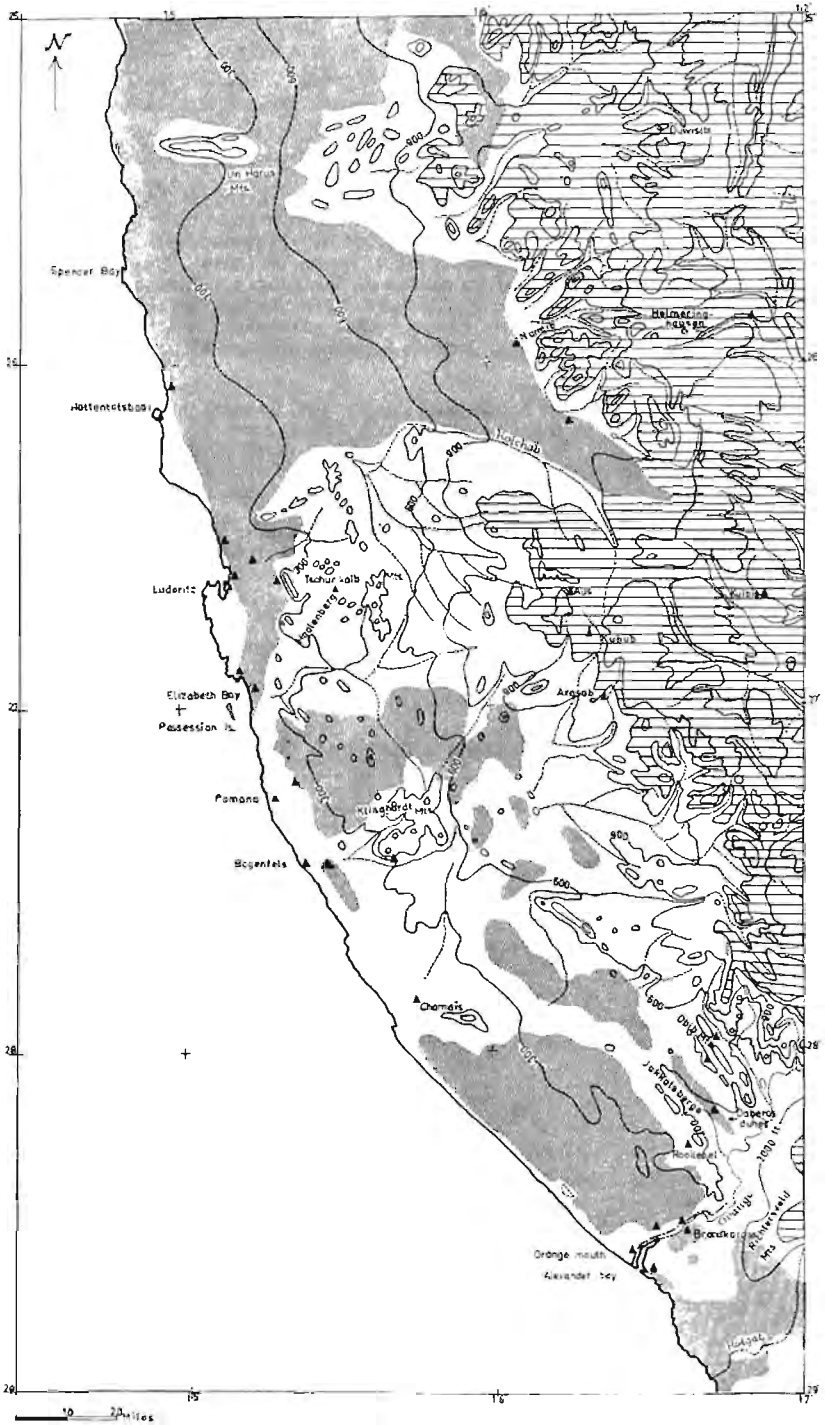
-  Semi-arid
-  Arid
-  Extremely arid (in the South African arid zone: Namib Desert; in the North African arid zone: Sahara Desert; in the Arabian arid zone: Rub Al Khali Desert)
-  Limits of Guinean forest regions (Congo-Indic forest)



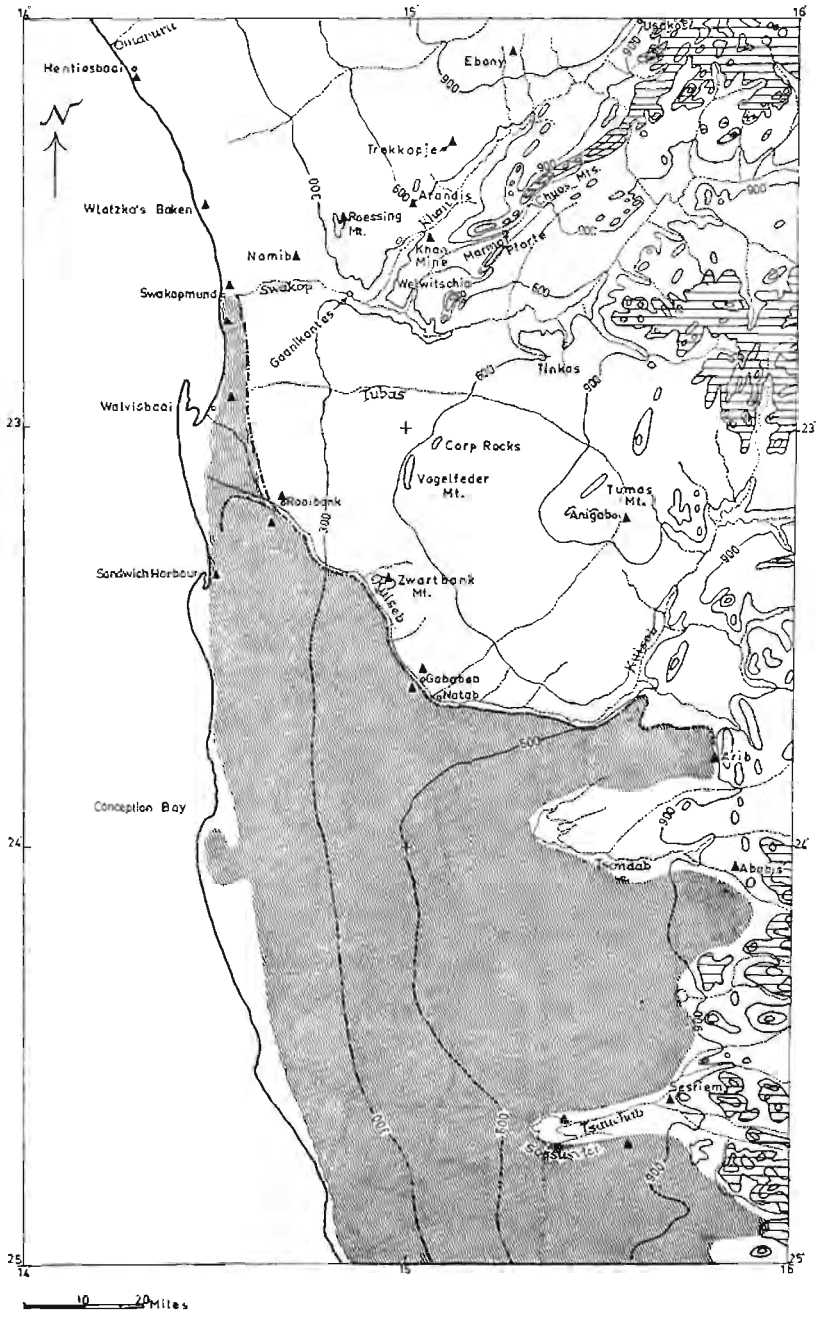
Map 2. Limits and divisions of the Namib Desert.

Maps 3-7. Topography of the Namib Desert and hinterland. (Maps 4-6, after the South-West African 1:800,000 map, 1955 edition [Surveyor General, Windhoek]. Map 3, after the same and the South African 1:500,000 map [Trigonometrical Survey Office, Pretoria]. Map 7, after the following maps: Beetz, W. (1938), *Klimaschwankungen und Krustenbewegungen in Africa südlich des Äquators von der Kreidezeit bis zum Diluvium* (*Geogr. Ges. Hannover, Sonderveröffentlichung*, 3); Gossweiler, J. & Mendonca, F. A. (1939), *Carta Fitogeografica 1:200,000* [*Gov. Geral de Angola*]; Ministerio das Colonias (1935), *Carta de Angola 1:1,500,000*.)

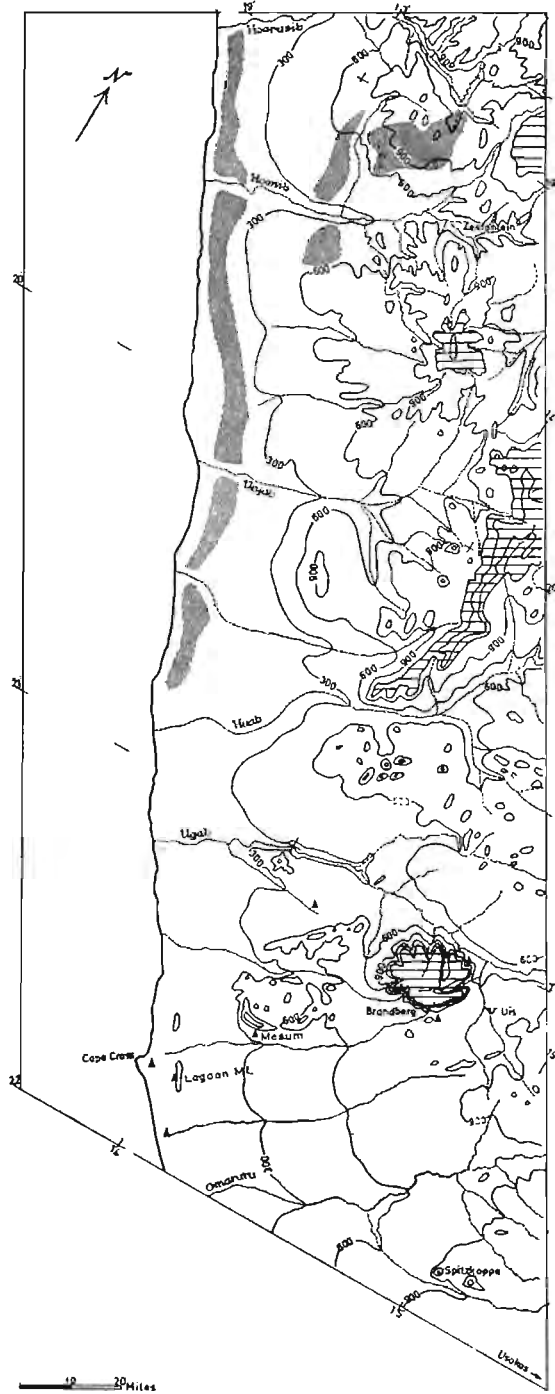
-  Contours. In South-West Africa: 300, 600 and 900 m contours (maps 3-6); in the Union of South Africa: 2000-foot contour (map 3); in Angola: 2000-foot contour (map 3) north of the Cunene River; 400 and 1000 m contours (map 7).
-  Highlands. Delimited by the 1200 m contour in South-West Africa and the Union of South Africa (maps 3-6), by the 1000 m contour in Angola (map 7).
-  Rivers
-  Pans
-  Faunistical border lines of the Namib
-  Collecting stations for Tenebrionidae
-  Systems of barchan dunes in the True Namib
-  Blown sand and small dunes of the Transitional Namib



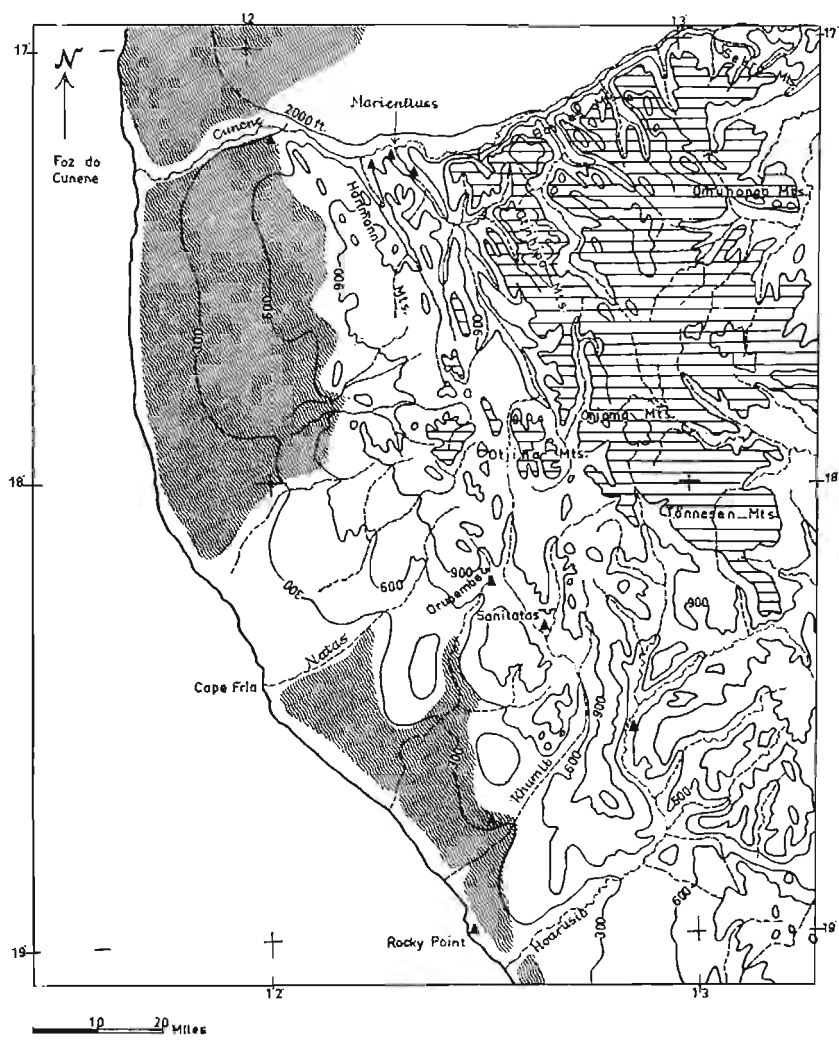
Map 3. North-western part of the Transitional Namib and southern part of the Southern Namib.



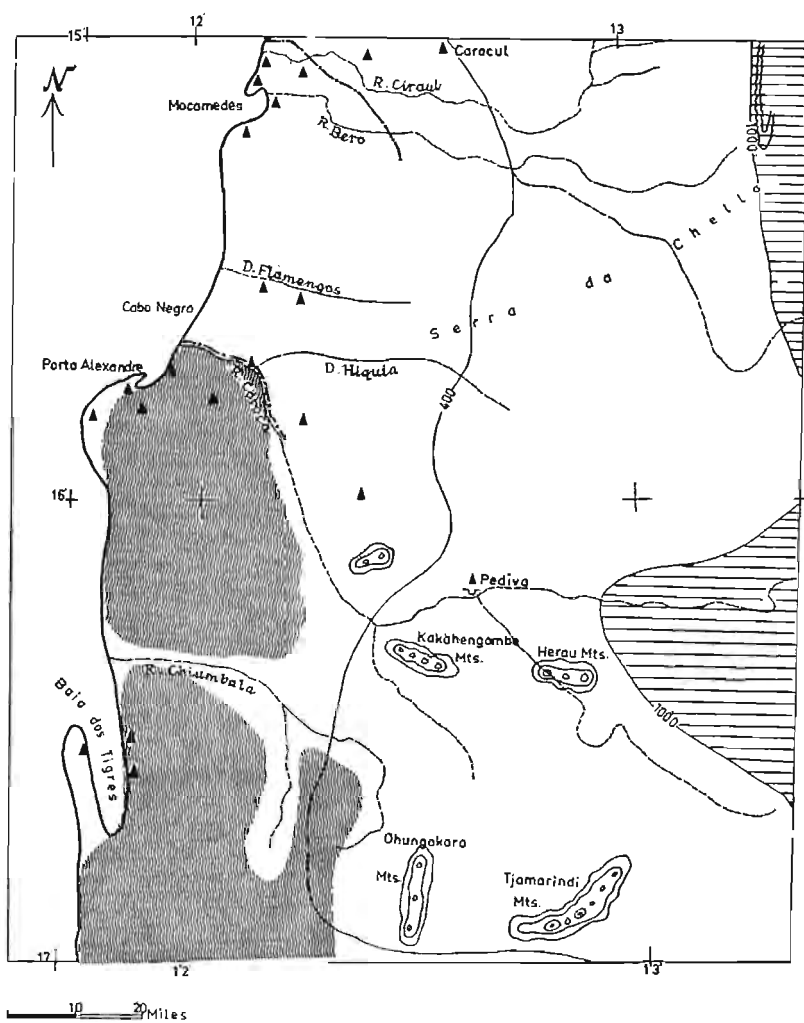
Map 4. Northern part of the Southern Namib and southern part of the Northern Namib.



Map 5. Central part 1 (south) of the Northern Namib.



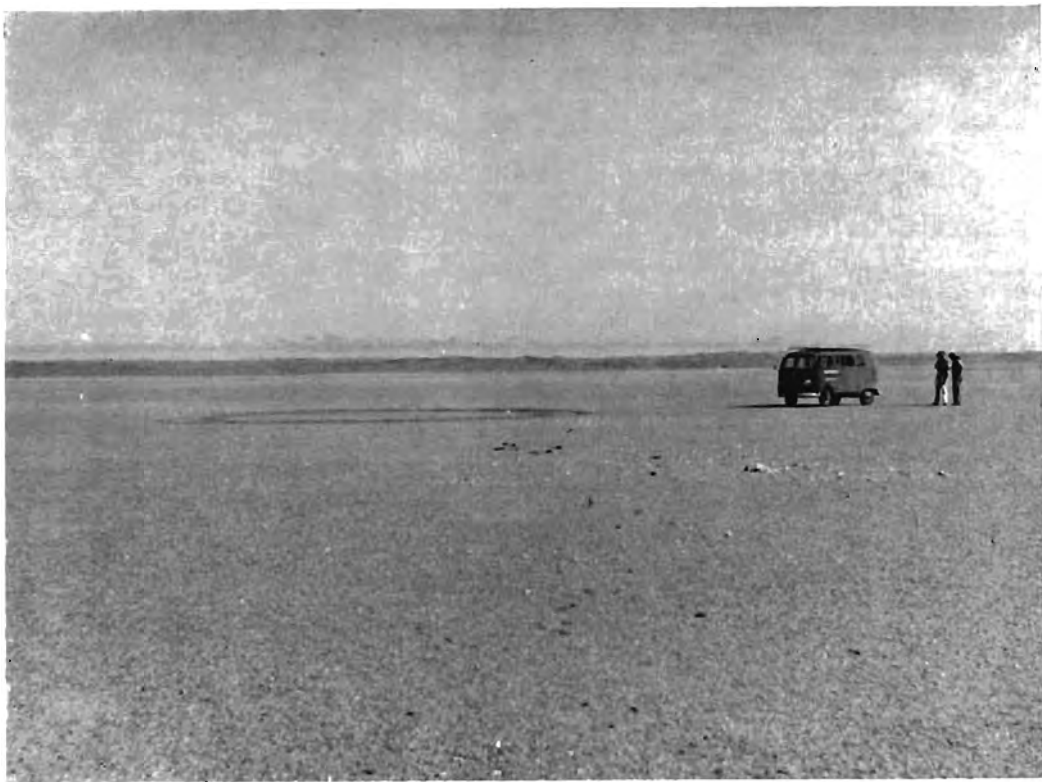
Map 6. Central part 2 (north) of the Northern Namib.



Map 7. Northern part of the Northern Namib.



Biotope of the vegetationless dunes. Marginal dunes of the Southern Namib system, at the southern bank of the Kuiseb River, close to Gobabeb. In the background the densely wooded Kuiseb-bed which sharply separates the dunes from the vegetationless gravel plains (background). At right the sharp and 'smoking' crest of a dune. (Photo C. K. Brain.)



Biotope of the vegetationless gravel plains. Perfectly flat plain of the southernmost portion of the Northern Namib, north-west of Gobabeb. On the horizon is the margin of the dune system of the Southern Namib, above a layer of sea mist. The Kuiseb-bed, which runs along the margin of the dunes, is not shown, as it is situated in a depression. (Photo C. K. Brain.)



*Biotope of an exotic, densely wooded Namib river-bed. Forest of *Acacia giraffa* and *albida* in the Kuiseb-bed, close to Gobabeb. This forest-gallery separates very sharply the vegetationless dunes in the south from the practically vegetationless gravel plains in the north. (Photo C. K. Brain.)*

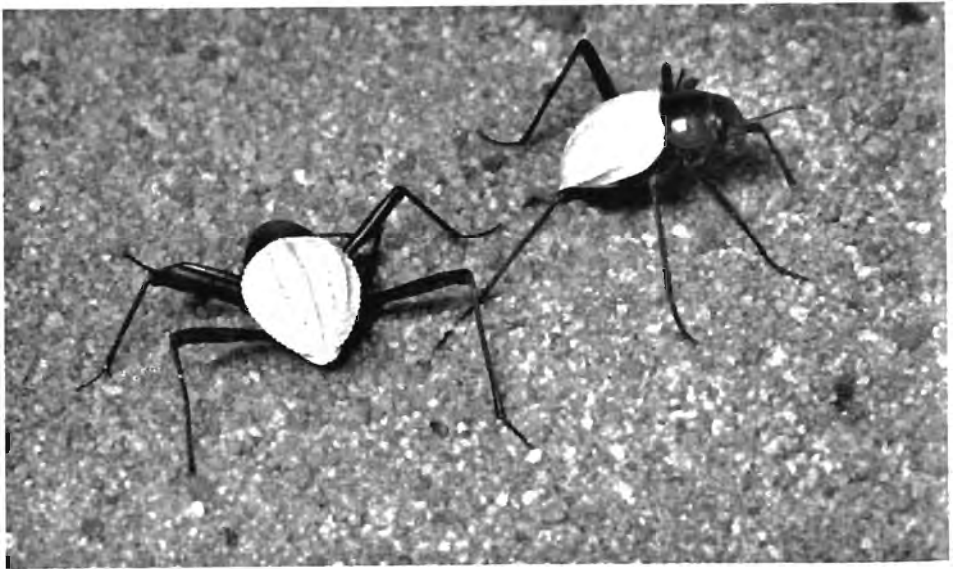


Psammodes diabolica Koch, f.t. A very peculiar, endemic species of the northernmost part of the *Transitional Namib* (lower Orange River area); nocturnal and psammo-petrophilous. (Transv. Mus. Insectarium. Photo C. K. Brain.) $\times 2$.



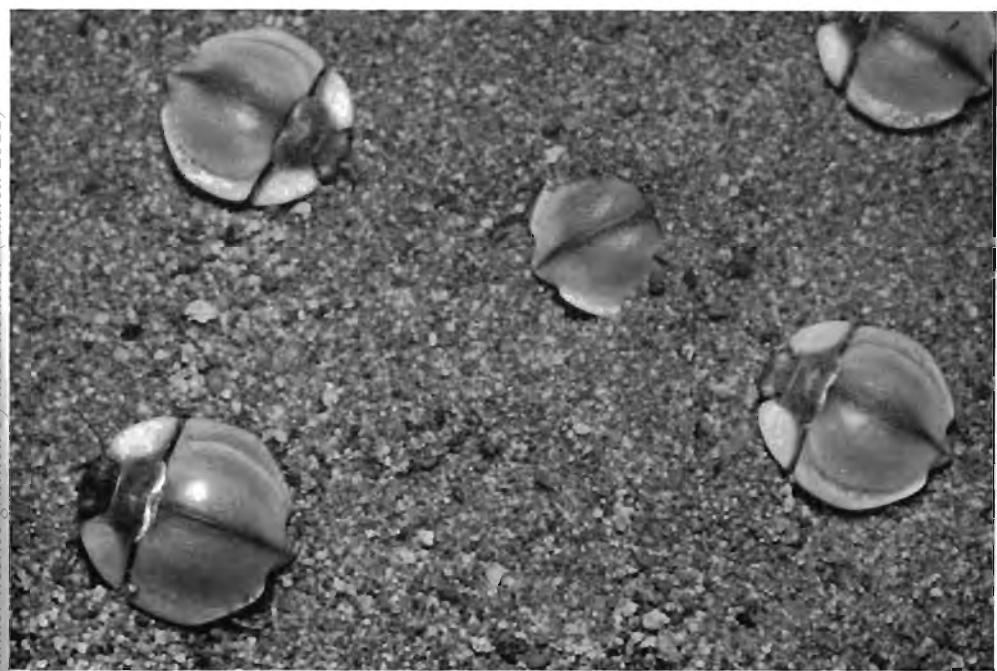
ABOVE. *Onymacris longicauda* Haag, f.t., an ultra-psammophilous and highly heliotactic runner of the vegetationless dunes of the *Southern Namib*. Female specimen burrowing. (Transv. Mus. Insectarium. Photo L. Schulze.) $\times 1.8$.

BELOW. *Onymacris rugatipennis* Haag, an errant plant-follower of the dunes of the *Southern Namib*; heliophilous. Male specimen in pursuit of the female. (Transv. Mus. Insectarium. Photo L. Schulze.) $\times 1.8$.



ABOVE. *Renatiella* (*Spongesmia*) *scrobipennis* (Haag), a slow-moving, diurnal but umbriphilous species of the Kalahari and the Highlands of South-West Africa, extending westwards into the Namib on all hard soils. (Transv. Mus. Insectarium. Photo L. Schulze.) $\times 2.6$.

BELOW. *Stenocara eburnea* Pascoe, one of the characteristic 'white' Namib Tenebrionids. A helotactic, fast runner of the gravel plains and mountains of the southern part of the Northern Namib. (Transv. Mus. Insectarium. Photo L. Schulze.) $\times 2.6$.



ABOVE. *Physosterna globosa* (Haag), f.t. (on right) and subsp. *epiphyroides* (Peringuey) from the southern portion of the Northern Namib. Extremely convex, diurnal but umbriphilous runners populating the sand of the Kuiseb-bed forest. (Transv. Mus. Insectarium. Photo L. Schulze.) $\times 1.8$.

BELOW. *Lepidochora eberlanzi* subsp. *parva* Koch, an ultra-psammophilous and strictly nocturnal Eurychorin from the vegetationless dunes between Walvis Bay and Swakopmund. Hygrophanous, depigmented and of complanate body shape. Centre specimen burrowing. (Transv. Mus. Insectarium. Photo L. Schulze.) $\times 2.2$.