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THE SOLIFUGAE OF SOUTH WEST AFRICA

by

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(With 12 Text-figures)

INTRODUCTION

No single study of the Solifuges of this region has been published although general works on the world fauna, such as Roewer's indispensable monograph of 1934 and Kraepelin's previous monograph in Das Tierreich (1899), give much varied information about the group. In Roewer's work especially all that is required to be known of the internal and external structure, physiology, development and ecology in general, has been collected into one volume. Hewitt's review of the South African fauna in 1919 is largely systematic and the number of known species has been doubled since he wrote. A fairly popular account of the group was given by Lawrence in Afrikaans (1943); more recently (1954) Roewer devoted eight pages of a general survey of the Arachnida of South West Africa to this group alone.

South West Africa has probably the richest and most varied Solifugid fauna of any region of comparable size in the world. In the following pages an attempt has been made to summarise our knowledge of this unique fauna and to give a check-list and keys for the identification of the families, genera and species which occur in the territory.

GENERAL ACCOUNT

The Solifugae represent an order of large, highly specialised Arachnida which are very well adapted for living in dry to arid conditions in semi-desert regions with low rainfall in various parts of the world.

In habit they are solitary, carnivorous, aggressive, and for the most part, nocturnal arachnids. Their movements, except in the case of the Hexisopodidae, are characteristically quick and agile. They differ from all the other orders

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of Arachnida in two very conspicuous characters: firstly, the enormous and powerful chelicerae which are able to crush the most strongly armed insect or scorpion and also to deal with a number of smaller invertebrates, lizards, snakes and birds fig. 3; secondly, the respiratory system is more efficiently developed than in any other arachnid order, with a system of very numerous and unusually wide tracheae. They are among the only arthropoda, other than certain pterygote insects, in which respiration is aided by rhythmic breathing movements of the thorax. There can be little doubt that the lightning quick movements of Solifugae can be attributed to the more efficient ventilation of the respiratory system by this means, and also to the greater volume of the main tracheal trunks.

In the day time, nocturnal forms are usually to be found under large stones while diurnal ones are most often met with in open thornveld or bushveld. A good example of the latter is *Solpuga sericea* which, while hunting for termites along the ground during the hottest part of the day, resembles, with its erratic gait and mane of silky hair on the hind legs, a fluffy seed being windblown hither and thither along the ground. Other observers have compared its restless movements with those of a questing dog checked in mid-career by the scent of game.

Apart from differences of size and colouring the diurnal and nocturnal species are sharply demarcated in their periods of activity, which do not overlap. In the Nyandu Bushveld of the Kruger National Park the diurnal species *Solpuga sericea* Pocock, a form often met with in South West Africa, is found along the margins of almost pure stands of the dry deciduous Msimbit forest *(Androstachys Johnsonii),* where it was captured in large numbers during the hottest time of the day by the writer and the biologist of the Park, Dr. U. de V. Pienaar, in November 1963. Both sexes were found running over the leaves and dry fallen branches of trees but never in the open further than 20 feet from the edge of the forest; by remaining perfectly still it was possible to hear the pattering of the feet of these small Solifuges running over the thin dry leaves which carpet the forest floor; a stationary male was not once observed during a strenuous hour spent in pursuing and capturing specimens of this *Solpuga,* while on only a single occasion was a female seen resting for an instant on a dry twig.

The grey woolly covering of hairs in this species is very similar in colouring to that of the dessicated pieces of fallen wood and dried leaves of the forest trees themselves but it probably serves a much more effective purpose by breaking up the body outlines of the animal itself, which become so blurred that it is impossible to tell, when catching a brief glimpse of the Solifuge coursing at erratic speed, whether it is arachnid, insect, or something not belonging to the animal kingdom at all.

Collecting at night in the same locality but on the road passing about 40 feet from the forest margin, not a single specimen of this species was captured; with the aid of a powerful reflecting lamp however, numerous other smaller Solifuges were obtained belonging to the genera *Zeriassa, Biton* and *Blossiola,* all nocturnal forms.

The diurnal forms are capable of climbing shrubs and low trees. When pursued *Solpuga sericea* may dash vertically at great speed up a slender tree trunk to a height of 10 feet and down again without loss of momentum or pausing for an instant. Hewitt says (1919, p. 19) that they will be found at times "swinging

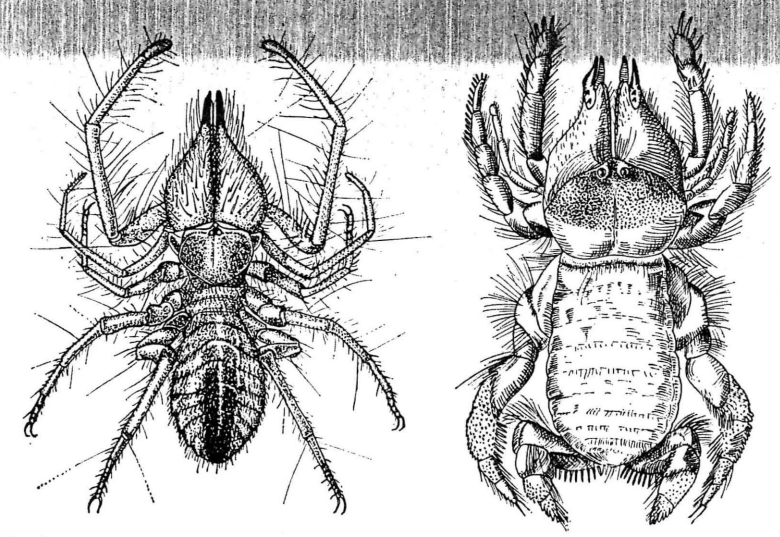

FIGURE 1.
Left, *Solpuga,* a long-legged Solifuge (Family Solpugidae), right, *Chelypus,* a short-legged form with strongly spined appendages modified for digging (Family Hexisopodidae). The figure of *Solpuga* much reduced in size.

from twig to twig like long limbed apes". Other nocturnal species build long shallow tunnels more or less parallel to the surface of the ground using the chelicerae as implements for digging, or they may take refuge during the day in natural crevices or cavities under stones. *Chelypus hirsti* has been observed in the Kalahari by Dr. W. S. Coaton (*in lit.*) to dig very swiftly into the sand with its strongly spined, rake-like legs, fig. 1. He says that "the speed with which it works its way under the sand with sweeping movements of the legs is unbelievably rapid".

Many Solifugae are termitophagous and these are not confined to the small or moderate-sized species; Dr. Coaton has seen long-legged Solifugae (Solpugidae) actively catching alates during the swarming season by day as well as by night. The small species of the genus *Hemiblossia* as well as various Hexisopodidae, such as *Chelypus hirsti,* have been found in termite mounds and are to a certain extent subterranean in habit (fig. 1), feeding largely, if not entirely, on termite workers and larvae. Females of the genus *Chelypus* have never been found, probably because they live an entirely subterranean existence in the galleries of termites. The voracious feeding habits of the larger Solifugae have often been described; by Lawrence (1949), Cloudsley-Thompson (1958, 1961), Bolwig (1952) and other authors.

Mating and development

Little is known with certainty about the mating behaviour patterns of the various types of Solifuges. Heymons (1902), was, until recently, the only author to describe the processes involved in the sexual contacts of Solifugae. Within the last two years however, two separate observations have been published; in the