

## **Neuropterology in Southern Africa**

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### **ABSTRACT**

Twelve families of Neuroptera, comprising about 444 species in 123 genera, occur in southern Africa. The varied climate, topography and vegetation of the subcontinent provide numerous habitats for this rich fauna. The following families, with approximate numbers of genera and species, are represented: Coniopterygidae (9, 30); Sisyridae (1, 4); Osmyliidae (1, 3); Berothidae (5, 10); Dilaridae (1, 1); Psychopsidae (3, 6); Hemerobiidae (7, 22); Chrysopidae (17, 79); Mantispidae (4, 35); Ascalaphidae (21, 61); Nemopteridae (15, 60); Myrmeleontidae (40, 140). Megaloptera are also present.

### **1. INTRODUCTION**

The southern African subregion is broadly defined as that area of the Afro-tropical Realm situated to the south of the Cunene and Zambezi rivers, or approximately 16° to 35° south latitude. It includes the territories of South Africa, Zimbabwe, Botswana, Namibia, Swaziland, Lesotho and the southern regions of Moçambique.

The climate, topography and vegetation is varied, with annual rainfall ranging from less than 50mm along the west coast to more than 1000mm in the eastern mountain ranges. Most of the subregion receives rain during the summer months, but the south western areas have a Mediterranean climate with winter rainfall. Ecological conditions and vegetation range from the arid Namib desert along the west coast to the Kalahari semi-desert in the interior, to the mountainous parts of the south western Cape, which constitutes one of the great floral kingdoms of the world, with typical macchia-type vegetation. Along the eastern Cape coast a mixed type of plant community is encountered, varying from macchia to coastal forest and thornveld, whilst further north, the central plateau of the Orange Free State and Transvaal is predominantly grassland. One of the striking features of the southern African landscape is the Drakensberg mountain range, lying along the eastern escarpment, with peaks reaching a height of 3500m, and undulating, sometimes rugged countryside, forming the foothills. Further east and north east, there is coastal and inland forest and bushveld savanna. Temperatures of minus 10°C are measured at some places during winter, whilst others experience temperatures in excess of 40°C during midsummer.

There is a correspondingly rich fauna of Neuroptera associated with this variety of biotopes, with 12 families represented in the subregion. In addition, the two families of Megaloptera, Sialidae and Corydalidae, are also present.

The first account of a southern African neuropteran was by LINNAEUS in 1758, when he described the ant-lion *Palpares speciosus* from the Cape. Since then, several authors have contributed to our knowledge of the Neuroptera, with the most significant contribution coming from the great Swedish neuropterist, BO TJEDER. He has monographed 8 of the 12 families, and his papers remain the standard references on the group. Despite the fact that no special surveys had been undertaken prior to TJEDER'S works, and his studies were based on casually collected specimens of Neuroptera in museum collections, he managed to cover major parts of the fauna in the families he documented. At present, about 444 species in 123 genera are known from the subregion (cf. 303 species in Europe). These figures are tentative as many species still await discovery and description, and the status of several others is uncertain.

The following table provides a summary of the families, the number of genera and species in each, and the main publications on the groups.

Coniopterygidae	9	30	Tjeder 1957; Meinander 1983
Sisyridae	1	4	Tjeder 1957; Smithers 1957
Osmylidae	1	3	Tjeder 1957
Berothidae	5	10	Tjeder 1959, 1968
Dilaridae	1	1	Under review, Minter
Psychopsidae	3	6	Tjeder 1960
Hemerobiidae	7	22	Tjeder 1961
Chrysopidae	17	79	Tjeder 1966
Mantispidae	4	35	Handschin 1959, 1960
Ascalaphidae	21	61	Under review, Tjeder
Nemopteridae	15	60	Tjeder 1967
Nemopterinae	11	50	Tjeder 1967; Picker 1984
Crocinae	4	10	Tjeder 1967; Mansell 1976-1981
Myrmeleontidae	40	140	Under review, Mansell
Corydalidae	3	7	Esben-Petersen 1923; Barnard 1931, 1940
Sialidae	1	1	Esben-Petersen 1920

Table 1: Families of southern African Neuropteroidea, indicating numbers of genera and species, and important references.

## 2. SYNOPSIS OF THE FAMILIES OF NEUROPTERA

This account provides a summary of our knowledge of each of the southern African families, and current research projects.

### 2.1 Coniopterygidae

In 1957 TJEDER listed 16 species in 6 genera, and in 1969 he added a further 3 species to the documented fauna. Since then, MEINANDER (1972, 1975,

1983) has significantly advanced our knowledge in his ongoing studies, and 30 species in 9 genera are now known. Nothing has been published on coniopterygid biology, although the author recently managed to correlate larvae and adults of *Helicoconis capensis* Endln.

## 2.2 Sisyridae

SMITHERS (1957, 1961) has added two species to the documented fauna since TJEDER'S 1957 revision. There are now 4 recorded species in 1 genus. P.C. BARNARD is to include southern African sisyrids in his current research on the family. There are no published accounts of biology, but larvae, associated with freshwater sponges, have recently been found along the Orange river.

## 2.3 Osmylidae

These insects are very rare, and there have been no developments since TJEDER'S paper in 1957. Three species in 1 genus are presently known, but immature stages still elude discovery.

## 2.4 Berothidae

Since his publication in 1959, TJEDER (1968) has described *Microberotha vesicaria* and *M. nigrescens* in the subfamily Rhachiberothinae, and another 3 species await description. U. ASPÖCK and H. ASPÖCK (1981, 1983) recently published taxonomic papers on the genera *Podallea* and *Nosybus*, but did not add new local taxa. They are presently undertaking a world revision of the family. The biology of southern African species is unknown and 5 genera comprising 10 species have been described from the subregion.

## 2.5 Dilaridae

This family has only recently been discovered in southern Africa, and is presently the subject of a paper by L. MINTER. It is represented by 1 new taxon which has been recorded from northern Namibia and the Transvaal; all the specimens, which are very small, have been taken at light.

## 2.6 Psychopsidae

There have been no additions to the 6 species in 3 genera that were listed by TJEDER (1960): These insects are fairly common in certain areas, and recent observations have been made on oviposition and early instars of *Silveira marshalli* (McL.) and *Cabralis gloriosus* Navás.

## 2.7 Hemerobiidae

No new taxa of this economically important family have been added to the list of 22 species in 7 genera listed by TJEDER (1961), despite systematic collecting by the present author. Again, nothing has been published on the biology of the southern African species.

## 2.8 Chrysopidae

Since TJEDER'S paper in 1966, BARNARD & BROOKS (1984) have added one species, *Ceratochrysa antica* (Walk.), to the documented fauna of 79 species in 17 genera from the subregion. Much research has been carried out on mass rearing techniques and biology of these important insects, and a detailed account of the biology of *Chrysoperla zastrowi* (Esb.-Pet.) was published by BARNES (1975).

## 2.9 Mantispidae

Very little is known about the local Mantispidae, and the southern African representatives are in urgent need of revision. HANDSCHIN'S (1959, 1960) papers are the most recent works on the family, but are not comprehensive, and many new species undoubtedly await discovery. The life-history of a South African species was described by BISSETT & MORAN (1967).

## 2.10 Ascalaphidae

This family is presently the subject of an extensive revision by Dr Bo TJEDER, and the first section of his monograph has been completed. This will be a major contribution to southern African Neuropterology and its publication is keenly anticipated. The larva of an unidentified species from southern Africa was described by HENRY (1979).

## 2.11 Nemopteridae

Two publications, MANSELL (1973) and PICKER (1984), on the subfamily Nemopterinae, have appeared since TJEDER'S (1967) monograph, and 50 species in 11 genera are now known.

The subfamily Crocinae has been intensively studied by the author (MANSELL 1976, 1977a, 1977b, 1980, 1981a, 1981b, 1983), and 10 species in 4 genera are now known from the subregion. The immature stages and biologies of all 10 species have also been documented in the above-mentioned publications.

## 2.12 Myrmeleontidae

This is the largest family of Neuroptera represented in southern Africa, with about 140 species in 40 genera. It is presently the subject of an extensive revision by the author, and the first paper in the revisional series is currently in press (MANSELL 1985). This publication provides an introduction to the series, including a summary of all previous work on southern African myrmeleontids. The only southern African entomologists who have published on the family are PÉRINGUEY (1910, 1911), YOUTHED & MORAN (1969a, 1969b, 1969c) and MANSELL (1974). Apart from the routine systematics, objectives of the study are to discover and correlate larvae with adults, and to elucidate their biologies and zoogeography.

## 3. SYNOPSIS OF THE FAMILIES OF MEGALOPTERA

### 3.1 Sialidae

The family is represented by only one known species, **Leptosialis africana** ESBEN-PETERSEN (1920). It is apparently very rare, but an excellent account of the immature stages and biology was given by CRASS (1949).

### 3.2 Corydalidae

This family is considered to be a relic fauna, now inhabiting the mountainous regions of the south western and eastern Cape, Natal and Transvaal. The 7 species in 3 genera have been treated by ESBEN-PETERSEN (1923), BARNARD (1931, 1940) and CRASS (1949).

#### 4. SURVEY AND COLLECTION OF NEUROPTERA

A systematic survey of the southern African Neuropteroidea has hitherto not been attempted. Until recently, all available material was collected on a more or less casual basis. The author has therefore undertaken to collect Neuroptera in as many areas as possible, in order to do a detailed survey, and to build up reference collections. This was especially necessary in economically important groups, such as Hemerobiidae, Chrysopidae and Coniopterygidae, where the collections are used to facilitate routine identifications, and also in the poorly known families. It is intended to compile fully representative collections of all families, complete with biological and distributional data, which will then be available for study.

One of the main difficulties in studying the southern African Neuroptera is that a working knowledge of the fauna of the rest of Africa, and even Madagascar, is required. Many of the taxa occurring in the eastern parts have a wide distribution in the Afrotropical Region, and the local fauna cannot be studied in isolation. Neuroptera to the north of southern Africa are poorly known and have never been systematically studied or collected. It is here that an international community of Neuropterists could make a significant contribution, as central and north Africa, as well as Madagascar, offer rich biota of Neuroptera, and exciting collecting and study potential. If studies in these areas could be combined with those already in progress in southern Africa, we could make much progress towards the elucidation of the Afrotropical Neuroptera.

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Note : References pertaining to southern African Neuroptera, not mentioned in the above list, are given by TJEDER (1957-1967) and in a paper in preparation, by HANDSCHIN (1959, 1960) and by MANSELL (1985). The bibliography is otherwise comprehensive.

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