

Chapter 4.2

An Inventory of the Mantodea and Phasmatodea in the Littoral Forests near Tolagnaro (Fort-Dauphin)

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Abstract

Eleven species of Mantodea and 11 species of Phasmatodea were recorded in the littoral forests of Petriky, Mandena, and Sainte Luce near Tolagnaro. Two genera and at least six species of Phasmatodea, and one genus and three species of Mantodea are new to science. The identification and descriptions of these new species are in progress.

Résumé

Inventaire des Mantodea et des Phasmatodea dans les forêts littorales des environs de Tolagnaro (Fort-Dauphin). Onze espèces de Mantodea et 11 espèces de Phasmatodea ont été inventoriées dans les forêts littorales de Petriky, Mandena et Sainte Luce près de Tolagnaro. Deux genres et au moins six espèces de Phasmatodea ainsi qu'un genre et trois espèces de Mantodea sont de nouveaux taxons pour la science. L'identification et les descriptions de ces nouvelles espèces sont en cours.

Introduction

The study of Mantodea from Madagascar started in 1839 with Serville who described the first species. It continued with the work of Bates (1863), Saussure (1870), Brancsik (1893, 1895), and Westwood (1889) when each described a new species. The first monograph work of Malagasy Mantodea by Saussure and Zehntner (1895) provided a list of 36 species, half of them described as new. Over the next 50 years, several authors described single species of Mantodea found on the island (e.g., Saussure 1899, Lambertson 1911, Giglio-Tos 1912, 1913, 1915, Beier 1929, 1935a, 1935b, Sjöstedt 1930).

The only relatively recent comprehensive treatment of the Mantodea fauna of Madagascar is that of Paulian (1957). Of the 52 species presented in that

work, four were new to science and 88% were listed as endemic. A few previously published records of Malagasy Mantodea were excluded from the work of Paulian, as he was doubtful of their presence on the island. In the second half of the twentieth century, a few new species were described (Paulian 1957, 1958, 1961), and Roy (1987) listed a total of 54 species of Mantodea on the island. More recently, work has been done to revise several genera and to describe new genera and species (Roy 1989, 2004, 2005, Mériguet 2005). Revisions of *Tarachomantis* and of several genera of the Tarachodidae and Iridopterygidae are currently being prepared (R. Roy, pers. comm.).

Until recently, the Phasmatodea of Madagascar has been almost completely neglected by entomologists, in spite of the fact that they are some of the largest and most colorful insects found on the island. No monograph or summary article had been written about the Malagasy members of this order until the recent publication of a preliminary checklist of type specimens (Cliquennois 2003). Since the taxonomy and systematic position of many species is currently uncertain, a lot of field and museum research still needs to be done. There is a large number of species in museum collections that remain undescribed. Unfortunately, some type specimens have been lost or destroyed like those in the Hungarian Museum, Budapest, by a fire in 1956. This considerably complicates taxonomic research. In such cases, the type localities should be revisited in order to collect more specimens of a given taxon, especially when specimens are not known to be present in other museum collections, and where the

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original species descriptions are inadequate to properly diagnose the species.

The first described, endemic species of Phasmatodea in Madagascar was *Achrioptera fallax*, which was named by Coquerel (1861). There are other Malagasy species that were named earlier, but their type localities were given as “Maurice” and “côtes d’Afrique” (Audinet-Serville 1838, Burmeister 1838). A few other articles were published in the nineteenth century, which described endemic Malagasy Phasmatodea (e.g., Wood-Mason 1879, Kirby 1891, Brancsik 1893, 1897, Finot 1897). From 1906 to 1908, the three-part monograph “Die Insektenfamilie der Phasmiden” (Redtenbacher 1906, 1908, Brunner von Wattenwyl 1907) described 52 new species. The only other twentieth century publications that described new taxa were Carl (1913), Chopard (1919, 1952), and Rehn (1940). Recently, several authors have continued work on the Malagasy Phasmatodea (Hennemann and Conle 2004, Zompro 2004, Cliquennois 2005). The most comprehensive study is being undertaken by Nicolas Cliquennois. At

present, about 80 species have been named, but further research is likely to double that number.

Methods

During a field study from October to December 2000, Mantodea and Phasmatodea were collected from transects in Petriky, Mandena, and Sainte Luce using a beating tray (Ozanne 2005, Fig. 1). Further, general collections of these two orders were carried out from February to May 2004, and from October 2004 to May 2005. The collecting effort was different in each forest: Petriky - 5 days in October 2000 and 2 days in April 2004; Mandena (fragment M13, M15, and M16) - several weeks in 2000, 2004, and 2005; and Sainte Luce (fragment S9) - several weeks in 2000, 2004, and 2005. Since the phytophagous Phasmatodea are nocturnal and generally hide on bark or branches during the day, the majority of specimens were collected during the night when they were feeding on leaves. For the predatory Mantodea, which feed on both diurnal and nocturnal invertebrates, collections were done both during the day and night.

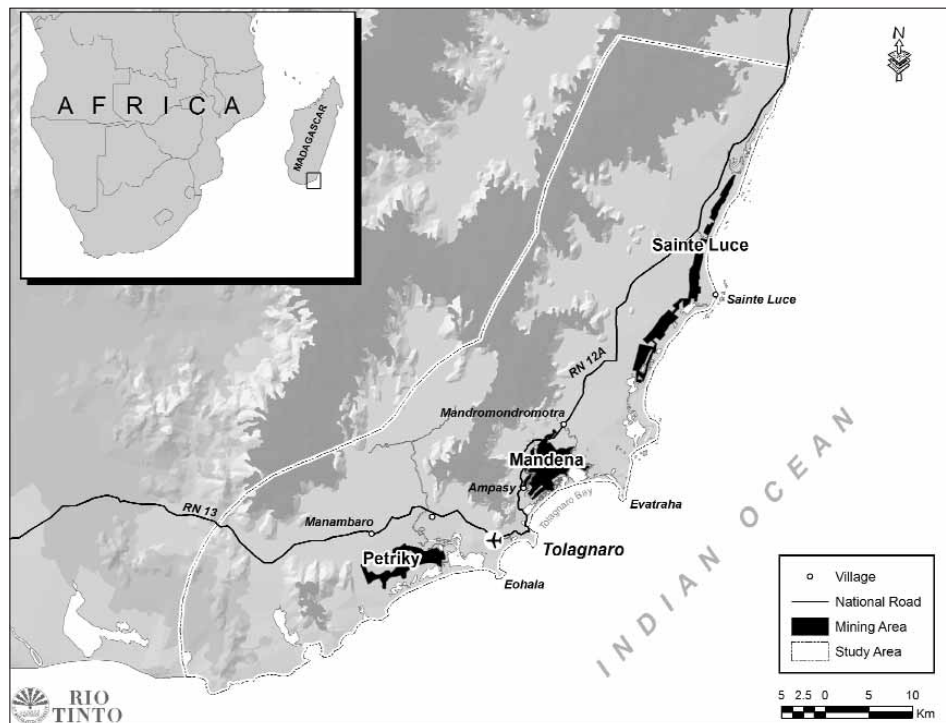


Figure 1. Overview of study sites for the inventory of Mantodea and Phasmatodea.

Table 1. Distribution of Mantodea in the coastal forests of Tolagnaro.

Taxa	Petriky	Mandena	Sainte Luce
Hymenopodidae			
<i>Phyllocrania paradoxa</i>		+	
Tarachodidae			
<i>Nesogalepsus</i> sp.		+	+
"Tarachodinae" sp.			+
Thespidae			
<i>Apterocorypha</i> sp.	+		
Iridopterygidae			
<i>Platycalymma</i> sp.			+
Mantidae			
<i>Tarachomantis</i> sp.	+	+	+
<i>Tisma freyi</i>			+
<i>Tisma pauliani</i>	+	+	
<i>Popa spurca</i> cf. <i>spurca</i>	+	+	
<i>Danuriella irregularis</i>			+
<i>Brancsikia aeroplana</i>			+

Voucher specimens of the Mantodea were preserved in alcohol for some months, and then pinned and dried. Phasmatodea were preserved in propanol and prepared as described by Zompro (1996).

Results and Discussion

Mantodea

The material collected in 2000, 2004, and 2005 in the coastal forests of Petriky, Mandena, and Sainte Luce comprises 11 species of Mantodea (Table 1). Eight genera and nine species are endemic to Madagascar. The systematic classification follows Ehrmann (2002).

Family Hymenopodidae

Phyllocrania paradoxa Burmeister, 1838. Also described from Madagascar as *P. illudens* Saussure and Zehntner 1895, and synonymized by Roy (1963). This species is also widely distributed in sub-Saharan Africa.

Family Tarachodidae

Nesogalepsus sp. Seven species of this endemic genus have been described, and are distributed across the island. A revision is in progress that will split the genus, and the number of species will increase (R. Roy, pers. comm.).

"Tarachodini" sp. A single male was found in November 2004 in the littoral forest of Sainte Luce.

This new species also belongs to a new genus. Four specimens of three other species of this genus are known from the collections of the Muséum national d'Histoire naturelle (MNHN), Paris, and the California Academy of Science (CAS). These specimens were collected in eastern Madagascar at Beparasy near Moramanga, on the Masoala Peninsula, and in the Ampasindava Forest in the far north.

Family Thespidae

Apterocorypha sp. The two species of this genus are found in portions of southeastern Madagascar. Further examination of the types, and the collection of specimens from different localities are necessary to confirm the identity of the specimens collected during these inventories.

Family Iridopterygidae

Platycalymma sp. Only one specimen was observed in the degraded southern part of the forest fragment S9 of Sainte Luce, and it was not collected.

Family Mantidae

Tarachomantis sp. A revision is in progress, eight species are known and the genus is distributed all over the island. Mériguet (2005) already separated the genus *Mantasoa* from *Tarachomantis*, from which he transferred *M. macula* (Saussure and Zehntner 1895) and described *M. lebbei*.

Tisma freyi Brancsik, 1893. A recent revision described three new species (Roy 2005), including *T. pauliani*. At present five species of the genus *Tisma* are described. Comparing ootheca with the known species of this genus, has led to the possibility that at least one more species exists.

Popa spurca cf. *spurca* Stal, 1856. This species is also found in sub-Saharan Africa. Several species, which are highly variable and difficult to distinguish, are known. A revision of material from the mainland of Africa has shown that only one species with two subspecies exists (Lombardo 1995).

Danuriella irregularis Westwood, 1889. Three species of this endemic genus are described, but several other species are known. A revision by R. Roy is in progress.

Brancsikia aeroplana Lamberton, 1911. This forest species has one generation per year and a wide distribution from the humid coastal and montane forests in Andasibe, south to near Tolagnaro. It was found in one of the Sainte Luce forest fragments.

Phasmatodea

The studied material comprises nine species of Phasmatodea (Table 2), of which at least six species and two genera are new to science. Field research has found that some of these species also occur in the nearby montane forests, but further exploration is necessary to determine the distribution of these new species. The systematic classification follows Bradley and Galil (1977) and Zompro (2004).

Areolatae

Antongiliinae

“Antongiliinae” sp. Nine genera of Malagasy Antongiliinae are described. The species collected in Sainte Luce do not correspond with any of them. An extensive revision is required. One part of a revision by Cliquennois (2006) is completed, and the other part is in progress.

Cirsia sp. This new species belongs to the genus *Cirsia*, which contains three species. Both sexes were found.

Leprodres dicranocollis Redtenbacher, 1906. Females and the yet undescribed males were collected. This species is also known from Isaka-Ivondro to the northwest of Tolagnaro. The other species originally described in this genus, *L. gibbifer* Redtenbacher, 1906, belongs in a different genus (N. Cliquennois, pers. comm.).

Pseudodatames sp. Two species were described by Redtenbacher (1906), and another species, only known from the female, was recently described by Zompro (2004). Specimens from Mandena and Sainte Luce are undescribed, but both sexes were collected. A comprehensive revision of this genus with new species included is in progress (N. Cliquennois, pers. comm.). The male holotype of *P. alluaudi* Redtenbacher, 1906 was found in “Sakavalana” about 70 km to the north of Tolagnaro. It should have been deposited in the MNHN, Paris, but the specimen could not be located in the collection.

Table 2. Distribution of Phasmatodea in the coastal forests of Tolagnaro. No Phasmatodea were found in Petriky.

Taxa	Mandena	Sainte Luce
Areolatae		
Bacillinae		
Antongiliinae		
“Antongiliinae” sp.		+
<i>Cirsia</i> sp.	+	+
<i>Leprodres dicranocollis</i>	+	+
<i>Pseudodatames</i> sp.	+	+
Anisacanthini		
<i>Parectatosoma</i> cf. <i>cervinum</i>		+
<i>Leiophasma</i> sp.1	+	+
<i>Leiophasma</i> sp.2	+	+
“ <i>Pseudoleosthenes</i> ” <i>irregularis</i>		+
<i>Xeranthrix</i> sp.1	+	
<i>Xeranthrix</i> sp.2		+
Anareolatae		
“sp.1”	+	+

Anisacanthini

Parectatosoma cervinum Redtenbacher, 1906. At present, seven species are known in this genus.

Leiophasma sp. 1 and sp. 2. Currently, sixteen species of this genus have been described from Madagascar. Further research and a revision of this genus are required.

"Pseudoleosthenes" irregularis Redtenbacher, 1906. The collected female specimens match the holotype housed in the Natural History Museum, Vienna, Austria. The male was also collected, but is currently undescribed. The actual placement of this species requires further research (N. Cliquennois pers. com.) since its egg structure indicates a close relationship with *Damasippoides albomarginatus* Redtenbacher, 1908.

Xerantherix sp. 1 and sp. 2. Four species have been described in this genus. The collected species were very common in parts of the forests of Sainte Luce and Mandena in November and December, and both sexes were collected. They belong to two new forms. Species differences in *Xerantherix* "sp.1" from Mandena and "sp. 2" from Sainte Luce are illustrated by the slight variation in the pronotum of the male and in the external genitalia of both sexes.

Anareolatae

"Anareolatae" sp. 1. This species does not belong to any known genus. Only a few specimens of either sex were collected on herbs near the ground in Mandena and Sainte Luce.

Acknowledgements

I wish to thank Nicolas Cliquennois, Roger Roy, and George Beccaloni for their help with the identification of the Phasmatodea and Mantodea, and for their comments on the manuscript. I am grateful to Jörg U. Ganzhorn for permanent support. Ulrike Aspöck (NHMW) and Christiane Amédégnato (MNHN) provided access to the natural history museum collections of Vienna and Paris, respectively. The paper is part of the cooperation between the Université d'Antananarivo, QIT Madagascar Minerals, and the University of Hamburg. I thank the Ministère des Eaux et Forêts and the Committee "CAFF-CORE" of the Malagasy Government for the permission to carry out this work. I also thank QIT Madagascar Minerals and their environmental and conservation team headed by Manon Vincelette for their support

and logistic help in the field. The project was supported by the Hamburger Universitätsstiftung and the German Academic Exchange Service (DAAD).

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