

The Lepidoptera of Curieuse Island, Seychelles

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Introduction

Curieuse Island is the fifth largest inner granitic Seychelles Island, and has an area of 286ha (Hill *et al.* 2002). Curieuse is a government owned National Park and is managed by the Seychelles National Parks Authority (SNPA), a parastatal organisation. Curieuse has several associated habitats; the bulk of the island consists of central hills with exposed red granite, up to 172m (Hill *et al.* 2002). Surrounding these hills are forested lowland coastal plateau areas. There are four main plateau areas, Anse Badamier on the north of the island and Anse Jose to the south, while Baie Laraie has two distinct plateau areas, the area of mangroves in the north west of the bay and surrounding the Park Rangers' Headquarters to the east of the bay (Hill *et al.* 2002) (Figure 1).

Lepidoptera in the inner granitic Seychelles Islands have been well studied on some individual islands (Lawrence 2005) and as described in the Indian Ocean Biodiversity Assessment 2000-2005 (Gerlach 2003). However, there is little comprehensive information available on the Lepidoptera that can be found on Curieuse Island. An overview of all the taxa found on Curieuse by Hill *et al.* 2002 described 2 species of butterfly (*Zizeeria knysa* and *Leptotes pirithous*) as present on Curieuse. However, no information was provided on the moth species found on Curieuse. Gerlach and Matyot (2006) collected and collated records for the Indian Ocean Biodiversity Assessment 2000-2005 (Gerlach 2003). Eleven species of lepidoptera were described as present on Curieuse in the monograph (Gerlach & Matyot 2006) that followed the Indian Ocean Biodiversity Assessment 2000-2005 (Gerlach 2003). A permanent scientific expedition base on Anse Jose on Curieuse Island is currently occupied by Global Vision International (GVI), facilitating the long term, regular use of light traps to investigate the species of macro-lepidoptera on Curieuse. The aim of this study was to produce a species list of the lepidoptera found on Curieuse Island.

Methods

This study took place between 9th April 2013 and 13th September 2013 at the site of a former leper colony, occupied by GVI on the coastal plateau at Anse Jose on the south coast of Curieuse Island. Samples were collected from 3 sites on the coastal plateau at Anse Jose (Fig. 2). Site 1 was situated in a small man-made clearing, surrounded by mature coastal trees, such as *Calophyllum inophyllum* (takamaka). Sites 2 and 3 were situated under the canopy of mature coastal forest, which included both palm and tree species. A Skinner trap with a 15w actinic bulb powered by a 12v battery was used

to attract specimens. Specimens were collected at least once a week throughout the study period, unless poor weather prevented the use of the light trap. Any opportunistic sightings of species around lights from occupied buildings of the expedition base were also recorded. The monograph 'Lepidoptera of the Seychelles Islands' (Gerlach & Matyot 2006) was used to identify specimens. Lepidoptera taxonomy is as described in Gerlach & Matyot (2006) and IUCN Red List Category Assessments from Gerlach *et al.* (2005) and Gerlach & Matyot (2006) are used.



Figure 1. A satellite image of Curieuse Island, the main beaches and landmarks are labelled. The red dots indicate the site of the expedition base currently occupied by GVI and the 3 sites sampled for Lepidoptera.

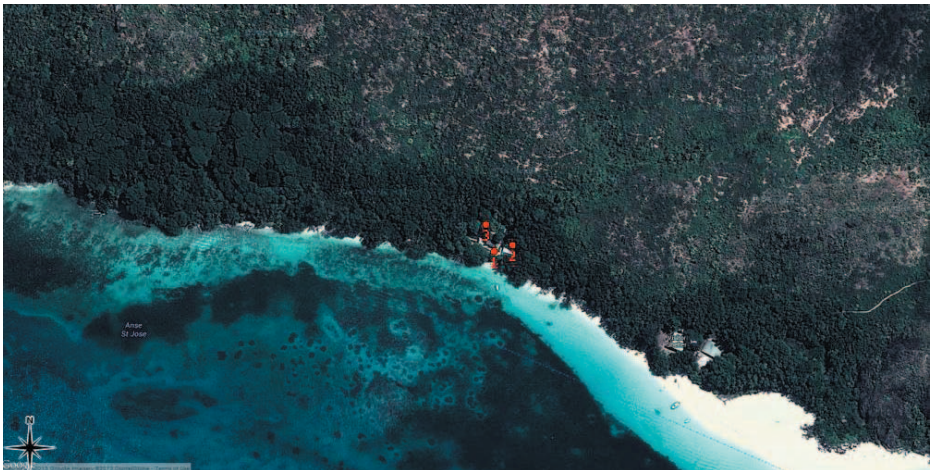


Figure 2. A satellite image of Anse Jose, on the south coast of Curieuse Island. The red dots indicate the 3 sites sampled for Lepidoptera at the GVI expedition base.

Results

During this study a total of 30 species of Lepidoptera were recorded on Curieuse Island over a 5 month period. The species recorded are listed in Table 1. An additional 10 species were recorded on Curieuse in 2001 and 2002 (Table 2) during data collection for the Indian Ocean Biodiversity Assessment 2000-2005, summarised in the monograph by Gerlach and Matyot (2006). Only one species, *Dirades theclata* was recorded by Gerlach and Matyot (2006) and also observed during the current study on Curieuse. The total number of species of lepidoptera recorded on Curieuse was 40. Of these 40 species 17 (42.5%) were species endemic to The Seychelles, 9 species (22.5%) are found in the tropics, 6 species (15%) have wide distributions across Africa, Asia and Europe, 5 species (12.5%) are only found in Africa and 3 species (7.5%) were restricted to the Indo-Pacific.

All species, apart from one, *Lamoria anella* (Fig. 3), are listed as Least Concern under the IUCN Red List Criteria (Gerlach *et al.* 2005). *Lamoria anella* is listed as Data Deficient. *Lamoria anella* was encountered on 7 occasions and a total of 18 individuals were observed during this study between 09/04/2013 and 15/06/2013. Only *Dirades theclata* and *Dudua aprobola* were encountered more times 58 and 62 times respectively. *Dirades theclata* and *Dudua aprobola* were both observed at 11 different times throughout each month of data collection for the study. In addition, 2 species of butterfly *Zizeeria knysa* and *Lampides boeticus* were regularly observed during the day throughout the study period, with *Zizeeria knysa* observed daily. The migratory *Hypolimnas misippus* was observed on 3 occasions during April 2013. Of the 30 species recorded in this study, 11 species were only observed once during the study period.

Discussion

The species list presented here is the most comprehensive and systematic study to date of the Lepidoptera that occur on Curieuse Island and has made a significant start to documenting the Lepidoptera of Curieuse. Curieuse appears to be relatively species poor in Lepidoptera when compared to other inner granitic islands, supporting only 40 species. Mahe supports 345 species and Silhouette supports 288 species (Gerlach & Matyot 2006). However, Praslin only supports 42 species (Gerlach & Matyot 2006). Curieuse is approximately 1km from Praslin, is geologically similar and has a similar climate to Praslin (Hill *et al.* 2002). Therefore, a comparison between Praslin and Curieuse is likely to be more useful than a comparison with Mahe or Silhouette.

In total, 552 species of lepidoptera have been recorded in the Seychelles Islands, 275 (50%) of which are endemic to the Seychelles (Gerlach & Matyot 2006). This pattern is similar to the pattern observed in this study on Curieuse, where 42.5% of the species recorded were endemic species. Although Curieuse Island only supports 40 species of Lepidoptera, a high proportion of these are endemic to the Seychelles islands. Curieuse Island also supports a high proportion of endemic flora (Hill *et al.* 2002) which may explain the high proportion of endemic species of lepidoptera. However, further research would be needed to confirm this hypothesis.

This study is unlikely to have been able to produce a complete species list of Lepidoptera supported by Curieuse Island. New species were recorded throughout the



Figure 3. Lepidoptera recorded on Curieuse Island.
a & b) *Lamoria anella*, c) *Acherontia atropos*.
Photos: a & c - K. Quinton, b - P. Woods.

study period and the study period did not cover a full year. Therefore, species with flight times outside of the period studied here will have been overlooked. This study was confined to one area of the coastal plateau at Anse Jose and no observations were made in additional habitats, for example mangroves, or elevated areas. However, the habitat on the coastal plateau of Anse Jose was described as ‘exceptionally rich’ in the Indian Ocean Biodiversity Assessment (Gerlach 2003) and so may support a greater species richness of Lepidoptera than other areas of Curieuse. However, study into further areas of Curieuse would be needed to confirm this. A greater range in island elevation rather than a larger island area leads to a greater species richness of Lepidoptera (Gerlach & Matyot 2006). Further study into additional habitats and particularly different elevations throughout an entire year could reveal the presence of further species on Curieuse Island.

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Appendix

Table 1. The species of Lepidoptera recorded on Curieuse Island, along with their global distribution (Gerlach & Matyot 2006) and IUCN Red List Category (Gerlach *et al.* 2005). LC is Least Concern and DD is Data Deficient. The total number of individuals of each species seen throughout the study period is also included.

Species	Distribution	IUCN Category	Number of individuals seen
<i>Tiquadra gypsatma</i> (Meyrick, 1911)	Endemic	LC	5
<i>Ethmia nigroapicella</i> (Saalmüller, 1880)	Indo-Pacific	LC	16
<i>Stathmopoda d.daubanella</i> (Legrand, 1958)	Endemic	LC	1
<i>Stathmopoda epilampra</i> (Meyrick, 1911)	Endemic	LC	4
<i>Mesophleps safranella</i> (Legrand, 1965)	Endemic	LC	4
<i>Autocharis amethystina</i> (Swinhoe, 1894)	Palaeotropical	LC	2
<i>Cirrhochrista perbrunnealis</i> (Fletcher, 1910)	Endemic	LC	1
<i>Omiodes indicata</i> (Fabricius, 1775)	Pantropical	LC	4
<i>Lamoria anella</i> (Schiffmüller, 1775)	Cosmopolitan	DD	18
<i>Etiella zinckenella</i> (Treitschke, 1832)	Pantropical	LC	3
<i>Phycita gloriosella</i> (Legrand, 1965)	Endemic	LC	3
<i>Endotricha mesenterialis mahensis</i> (Whalley, 1963)	Endemic	LC	1
<i>Hypsopygia mauritialis</i> (Boisduval, 1833)	Asia and Madagascar	LC	1
<i>Dudua aprobola</i> (Meyrick, 1886)	Indo-Pacific	LC	62
<i>Eccopsis incultana</i> (Walker, 1863)	Africa	LC	1
<i>Polydesma umbricola</i> (Boisduval, 1833)	Palaeotropical	LC	1
<i>Chloroclystis nigella</i> (Joannis, 1906)	Africa	LC	1
<i>Petrodava madecassaria</i> (Boisduval, 1833)	Africa	LC	1
<i>Thalassodes quadraria</i> (Guenée, 1875)	Palaeotropical	LC	6
<i>Dirades theclata</i> (Legrand, 1966)	Palaeotropical	LC	58
<i>Euproctis pectinata</i> (Fryer, 1912)	Endemic	LC	3
<i>Achaea catella</i> (Guenée, 1852)	Africa	LC	1
<i>Remigia frugalis</i> (Fabricius, 1775)	Palaeotropical	LC	1
<i>Stictoptera poecilosoma</i> (Saalmüller, 1880)	Indian Ocean	LC	4
<i>Acherontia atropos</i> (Linnaeus, 1758)	Africa and Europe	LC	2
<i>Lampides boeticus</i> (Linnaeus, 1767)	Europe, Palaeotropical	LC	4
<i>Lepotes p. pirithous</i> (Linnaeus, 1767)	Europe and Africa	LC	1
<i>Zizeeria knysa</i> (Trimen, 1862)	Africa, Europe, Asia	LC	5
<i>Hypolimnas misippus</i> (Linnaeus, 1764)	Palaeotropical	LC	3
<i>Melantis leda</i> (Linnaeus, 1758)	Palaeotropical	LC	2

Table 2. Additional species recorded as present on Curieuse by Gerlach & Matyot 2006, along with their global distribution and IUCN Red List Category (Gerlach *et al.* 2005) (LC = Least Concern).

Species	Distribution	IUCN Red List Category
<i>Pitharca chalinaea</i> (Meyrick, 1908)	Africa	LC
<i>Amphixystis sicaria</i> (Meyrick, 1911)	Endemic	LC
<i>Caloptilia megalaurata</i> (Legrand, 1966)	Endemic	LC
<i>Ascalenia pseudofusella</i> (Legrand, 1965)	Endemic	LC
<i>Labdia tentoria</i> (Meyrick, 1911)	Endemic	LC
<i>Pyroderces firma</i> (Meyrick, 1911)	Endemic	LC
<i>Pyroderces jonesella</i> (Legrand, 1965)	Endemic	LC
<i>Pyroderces longalitella</i> (Legrand, 1965)	Endemic	LC
<i>Metachanda brunnepunctella</i> (Legrand, 1965)	Endemic	LC
<i>Metachanda fortunata</i> (Meyrick, 1911)	Endemic	LC