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CHAMAELEONIDAE 2001

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Dear Sir or Madam,

Please find enclosed a preliminary report for Chamaeleonidae 2001, which the Davis Expedition Fund Committee very kindly sponsored.

Chamaeleonidae 2001 apologises for the delay in sending this report. We will publish a final report later this year, which will include full statistical tests and conclusions. This will be sent to you as soon as it is available.

Many thanks for your support.

Yours sincerely

A handwritten signature in black ink, appearing to be 'R. Lord'.

Rosanne Lord
Co-ordinator, Chamaeleonidae 2001

Preliminary Report – Chamaeleonidae 2001

Abstract

A chameleon species diversity survey was conducted in Ambodiriana Forest Reserve (north-eastern Madagascar) and the surrounding deforested areas. From these results a comparison of the chameleon species found and their abundance in the primary forest and the surrounding deforested areas could be made. Three species were found in the primary forest; *Calumma parsonii parsonii*, *Calumma nasuta*, *Brookesia superciliaris*. Only one species, *Calumma nasuta*, was found in the surrounding deforested area. The abundance of *Calumma nasuta* in the deforested area was also much lower than in that of the primary forest.

Background and Justification

Madagascar is recognised worldwide as an area of exceptionally high biodiversity, with many endemic species. The reptiles (herptofauna) are a highly diverse group. Of these, the chameleons are of particular interest due to their high degree of endemism. 56 of the 130 recognised species of chameleon are found only in Madagascar, these are assigned to three genera: *Calumma*, *Furcifer* (typical chameleons) and *Brookesia* (leaf, ground chameleons). However such species are believed to be under threat, with forest degradation being one of the principle causes to changing chameleon biodiversity.

Forest degradation in Madagascar is increasingly widespread. In 1997, protected areas covered 1.9% of Madagascar's total land use. The remaining areas are susceptible to slash and burn techniques. The establishment of secondary forest may follow; however this is cleared in progressively shorter cycles as the Malagasy population continues to rapidly increase. Many reptiles are dependent upon the rainforest ecosystem, The vegetation left by slash and burn is thought to be inadequate to support life for almost all chameleon species. The absence of comprehensive research has meant that the true strength of this threat is unknown, particularly the effects at the level of individual species.

Aim: To contribute to the understanding of how deforestation is affecting the chameleon population of Madagascar.

Objectives:

- 1) To determine the species diversity and population density of chameleon species within a protected area, Ambodiriana Forest Reserve, and an unprotected area liable to forest destruction.
- 2) To survey the major vegetation types and determine the level of deforestation.
- 3) To investigate which chameleon species appear more vulnerable to the effects of habitat destruction.
- 4) To investigate into the views held by the local people regarding the status of the chameleon and the need for conservation.

Methods

Transects were established 24 hours prior to walking, thus minimising disturbance. Three randomly chosen 150m transects were walked each night. Two researchers walked each transect, one looking left the other right. Most chameleons were bagged and returned to camp. Species identification and measurements were conducted the following morning, the chameleons then being returned to the exact location of their finding. Measurements conducted allowed an overview of the population configuration, i.e. the numbers of each lifestage in Ambodiriana. This data was taken in accordance with the methods of Brady *et al* (1999) so that it could be compared in future studies. However this data is not necessary for the species diversity count and so is not discussed further.

A total of 20 transects were walked, 10 in the protected reserve and 10 in the disturbed neighbouring area.

Vegetation Survey

For each transect we surveyed the vegetation in three 5 x 5 metre squares to allow us to assess the condition of the habitat and the effect of human influence e.g. deforestation, within each area. The numbers of trees in each of four categories were counted: Giant trees (>1m circumference at breast height), large trees (>10m in height), small trees (>5m, <10m in height) and stumps. The relative numbers of the different trees, especially giants, is an indicator of the past exploitation of the forest with the larger, more valuable trees often having been removed by local people prior to Ambodiriana becoming a reserve. Measurement of the distance between giants enabled us to estimate their density in the different areas.

We then counted the numbers of ravinala, pandanus, guyava and tree fern in each quadrat. All four species are exploited by man. The presence of tree ferns and pandanus suggests an area is undisturbed and humid whereas ravinala and guyava are indicative of disturbed areas and may be planted by local people. We also estimated the percentage cover of four species; ground fern, lungose, dianela and bracken. Ground fern is sensitive to disturbance and is found only in humid, shady areas whereas lungose quickly colonises damp cleared areas followed by bracken and dianela as the soil quality deteriorates over time. Finally we estimated the canopy and ground cover of each quadrat.

Results

| Chameleon species | Number found within reserve | Number found in deforested area |
|----------------------------------|-----------------------------|---------------------------------|
| <i>Brookesia superciliaris</i> | 10 | 0 |
| <i>Calumma nasuta</i> | 8 | 1 |
| <i>Calumma parsonii parsonii</i> | 2 | 0 |
| | | |
| Total number found | 20 | 1 |

Brief discussion

Chameleons are traditionally feared by several of Madagascar's tribes, believing that they are a link with the ancestors and are best left undisturbed. Some of the camp staff even refused to touch them. Subsequently it is hard to gain much verbal information from locals about the chameleon species found in the area and whether or not they thought numbers were increasing or decreasing. However our studies clearly showed that overall numbers were dramatically reduced in the deforested areas.

Statistical analysis is being carried out on both the vegetation and chameleon species raw data and will be included in a full report to be written up this year. It will also be incorporated into a study which was carried out simultaneously with our own by Jeanneney Rabearivony, University of Antananarivo. This study clearly showed that that certain species were better adapted to the more deforested areas. *Calumma nasuta* was found to inhabit the deforested areas as well as those less degraded. However, the other two species were not.

Although a lower number of chameleons were found in the forested area than expected, the study must be repeated in the summer months (November – late January) to allow any strong conclusions to be drawn. The large amount of rainfall and low temperatures may have affected the roosting habits of the chameleons, thereby making them harder to find. Jeanneney Rabearivony is hoping to look into this aspect further.

Future project recommendations

Ambodiriana would be a fantastic destination for future expedition groups with a great deal of scope for further biological study. In particular, further studies of reptiles and amphibians would be recommended due to the large numbers of frogs, snakes, geckos (*Phelsuma* and *Uroplatus*) and skinks. We also encountered several lemur and bird species as well as many insects and plants

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