Survey of the non marine molluscs of Mayotte

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Abstract: A survey of the non-marine mollusca of Mayotte island recorded 69 species, including 47 endemics (68%). The Streptaxidae make up 43% of species. This may be the highest percentage of carnivorous snail species anywhere in the world.

Key words: Comoros, conservation status, diversity, Mollusca.

The land snails of the Comoro Islands are relatively well known with over 118 described native species. Most of what is known about the islands' snail fauna is based on collections from the nineteenth century. This has been reviewed by Fischer-Piette and Vukadinovic in 1974.

For 2 weeks in April 2001 Dr P.Bouchet and Mr A. Abdou of the Malacology department of the National Museum of Natural History Paris (MNHN), carried out a survey of non marine molluscs on the island of Mayotte in the Comoros. They were joined by the author for 1 week. This was the first systematic non marine survey conducted on Mayotte. The results of the survey are detailed below.

Introduction

The Comoros Islands lie at the northern entrance to the Mozambique Channel. They consist of an archipelago of 4 islands. The largest is Grande Comore, 1025 square km, followed by Anjouan, 424 square km, Mayotte 374 square km and the smallest Mohéli, 211 square km. The volcanoes which formed the Comoros began to emerge from the sea about 15 million years ago. Mayotte was the first to emerge, followed by Anjouan, Mohéli and finally Grande Comore which still has an active volcano and the highest mountain in the Comoros – 2361 metre Mt Karthala (Swaney & Willox 1994).

Mayotte is the most easterly of the Comore Islands and is the only one still belonging to France. It's political status is that of 'Collectivité territoriale'. The territory of Mayotte consists of 2 main islands: Grand Terre (356 km square) and the island of Dzaoudzi or Petite Terre (18 km^2) which once housed the main administrative center. Mayotte, as the oldest of the Comoro Islands, has mostly low rounded hills and a maximum altitude of 660m. It has a variety of micro climates ranging from arid to humid. The population was in 1999 1 30,000 and is growing rapidly.

As a result of extensive shifting agriculture only 1,150 ha of the native forest cover remains. This is nearly all humid forest confined to mountain tops with some small areas of dry lowland forest. Much of the rest of the island is covered in secondary vegetation. This regeneration has been possible because of the decline of shifting agriculture associated with increased living standards, linked to the political status of the territory (Louette 1999).

Methods

The survey of Mayotte was focused on the remaining areas of native vegetation. Using information from Louette (1999) and from discussions with the Mayotte forestry service, the remnant areas of native forest were identified and most were visited. In addition areas of geological interest such as the base of cliffs and the lake of Dziani Dzaha on Dzaoudzi, were also visited. Sampling was also done in areas of secondary forest. The freshwater fauna and that occurring in saltmarshes and mangroves (Elobiids etc), was only incidentally surveyed.

Table 1 Mayotte Mollusca collected during the survey

Land	1	*Tropidophora xanthacheilum*	Land	34	*Edentulina crosseana*
	2	*Tropidophora creplini*		35	*Edentulina ovoidea*
	3	*Tropidophora sowerbyi*		36	*Pseudelma auriculata*
	4	*Tropidophora moniliata*		37	*Pseudelma inconspicua*
	5	*Tropidophora semilirata*		38	*Pseudelma bisexigua*
	6	*Cyclophorus microscopicus*		39	*Pseudelma incisa*
	7	*Cyclotopsis nevilli*		40	*Pseudelma martensiana* (?)
	8	*Cyclotopsis* sp		41	*Subulina pyramidalis*
	9	*Cyclophorus* sp		42	*S.glabella*
	10	*Clophorus dubius*		43	*S.simplex*
	11	*Clophorus granum*		44	*Pseudopeas sp*
	12	*Clophorus raripilus*		45	*Trachycystis arachne*
	13	*Cyclosurus mariei*		46	*Trichia radiolata*
	14	*Rachis venustus*		47	*Trichia mutica*
	15	*Rachis badiolus*		48	*Trichia homalospira*
	16	*Quicka* sp nov		49	*Acanthinula sp*
	17	*Geostilbia mariei*		50	*Econulus microsoma* (?)
	18	*Streptostele acicula*		51	*Naninia comorensis*
	19	*Gonospira cryptophora*		52	*Naninia renitens*
	20	*Gullela brevicula*		53	*Dupontia* sp
	21	*Gulella callosa*		54	*Louisia dupontiana*
	22	*Gulella costellata*		55	*Microcystina mathildae* (?)
	23	*Gulella denticens*		56	*Kaliella comorensis*
	24	*Gulella diodon*		57	*Nesopupa comorensis*
	25	*Gulella lubrica*		58	*Nesopupa minutalis* (?)
	26	*Gulella larva*		59	*Gastrocopta seignaciana*
	27	*Gulella mayottensis*		60	*Pupilla* (?) sp nov
	28	*Gulella miniscula*			
	29	*Gulella pusilla*	Introduced	I 1	*Achatina fulica*
	30	*Gulella sesamum*		I 2	*Achatina immaculata*
	31	*Gulella trigona*		I 3	*Subulina striatella*
	32	*Gulella vermis*		I 4	*Allopeas gracilia*
	33	*Gulella* sp nov		I 5	*Allopeas clavalinum*
Mangroves	M 1	*Assiminea punctum*	Freshwater	F 1	*Melanoides tuberculata*
	M 2	*Acmella parvula*		F 2	*Thiara amarula*
	M 3	*Melampus (Tralia) semiplicatus*		F 3	*Septaria borbonica*
	M 4	*Melampus graniferus*		F 4	*Neritina* sp
	M 5	*Cassidula labrella*		F 5	*Neritina* sp B
	M 6	*Auriculastra gassieri*		F 6	*Lymnaea* sp
	M 7	*Melampus* sp			

Table 2 Summary of described native snail and slug species (from Fischer-Piete & Vukadinovic 1974)

	Grand Comore	Moheli	Anjouan	Mayotte
Endemic species	18	2	13	47
Shared with other island in Comores	12	9	23	17
Shared with Madgascar	-	5	-	5
Shared with Zanzibar	-	1	-	-
Total	30	12	41	69

Table 3 Total number of species of described snails and slugs in the Comoros Islands.

	Number	% of native species
Endemic to Grande Comore	18	15
Endemic to Moheli	2	2
Endemic to Anjouan	13	11
Endemic to Mayotte	47	40
Shared with 2 or more islands	27	23
Shared with Madagascar	10	8
Shared with Zanzibar	1	1
Total native species in the Comoros Island	118	

Results

The preliminary results of the survey are set out in table 1. They are preliminary as they are based on field notes and sorted material (including leaf litter samples) from the 10 stations surveyed with the author (out of a total of 18 stations surveyed). While slugs were collected at all stations, these have not yet been examined. Although only preliminary, the data from these 10 stations are sufficient to provide good information on the current diversity and conservation status of the Mayotte land snails.

Discussion

The land snail fauna of Mayotte has a number of features that the survey served to confirm. Tables 2 and 3 give a break down on the native land snail fauna island by island. From this it can be seen that Mayotte has the greatest number of species as well as the greatest percentage of endemics: 68%. While this can perhaps be partially a collection artifact (Mayotte has always been the most French and hence the better collected of the islands), it reflects logically the greater age of the island. Mayotte has a few endemic genera including (*Pseudelma*) of the carnivorous snail family Streptaxidae. It also has the greatest radiation of the Subulinidae in the archipelago.

The overall snail diversity of the Comoros (118 described native species) compares closely to that of the Mascarenes with at least 146 native species (Griffiths 1996). There are however a number of differences. The Comoros have a higher diversity at a family level, reflecting their less isolated position. Also the Mascarenes lack completely the impressive radiation of slugs found in the Comoros. One area the Comoros in general and Mayotte in particular, have in common with the Mascarenes is the extensive radiation of carnivorous snails. In Mauritius streptaxid species represent 26% of the snail fauna, which is already considerable. In Mayotte they represent an exceptional 43% of the fauna. This is probably the highest percentage of carnivorous snail species anywhere in the world. Mayotte (and Anjouan) is also home to the largest streptaxid snail in the world: *Edentulina ovoidea*, which can measure up to 51mm (shell length).

Mayotte is also home to one of the most bizarre of all snails, the tiny uncoiled

Cyclosurus mariei Morelet, 1881. This snail can be found adhering to mossy rocks and logs (Clausilid like) in all areas of native forest.

From a conservation status stand point the results were very surprising in a positive way. Given that the main knowledge of the Mayotte fauna is based on the collections of Mr. M. Marie in the late 19th century and that since then most of the native forest has gone, it was expected to find a conservation situation analogous to Mauritius. There 32 % of the species overall and 39% of the endemics are extinct and much of the remainder critically endangered (Griffiths 1996). In Mayotte, as soon as you went into any area of native forest, it was quickly apparent that native snails were everywhere. Many endemics, including *Cyclosurus mariei* are very common. Significantly all the large species are present. The three largest endemics: *Tropidophora sowerbyi*, *Tropidopora xanthocheilum* and *Edentulina ovoidea* and many of the smaller snails and slugs also occur commonly in secondary forest and even in gardens. Furthermore one species recorded from dead collected specimens and believed at that time to be extinct: *Tropidophora semilirata* (Morelet, 1881), was turned up alive in the survey. The survey also turned up at least two and possibly more new species. While a few Mayotte endemic species were not found it is likely that they may still be present.

Although a number of introduced species occur on Mayotte, no trace was seen of *Euglandina rosea* and *Gonaxis quadrilateralis*. Both these species have been introduced to Grande Comore and it was feared that they may have been introduced to Mayotte. The devastating impact of one of these species (*E.rosea*) on native snail faunas is well known Griffiths *et al* 1993). Interestingly *E.ovoidea* has now been introduced to Reunion where it may turn out to be a threat to Reunion's native snails (pers.observation of the author).

The survey showed that from a conservation stand point the native snails of Mayotte are in a relatively good situation. Although only limited areas of native forest remain, they contain healthy populations of most of the land snail fauna. It is also clear that human pressure on Mayotte's forest have declined over the last 20 years. It is essential however that remaining areas of native forest are protected fully. The conservation situation on the other islands of the Comoros is however very alarming. A high priority should be accorded to surveying these islands soon.

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