

Original article

Biodiversity and Conservation of the Reptiles of the Mount Cameroon Area

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Abstract.—A survey of reptiles was undertaken in the Mt. Cameroon region. We recorded 74 species of reptiles from 49 genera and 14 families. An additional 12 species have been found in the area but were not detected during our research at Mt. Cameroon. The total of 86 species represents more than one third of the reptilian fauna known in Cameroon, making this site among the richest in the country. Lowland forest had the greatest number of species (58) followed by submontane forest (45) montane forest (21) and marine (4) species. A number of rare or little known reptiles were encountered in the region including: the skink *Lacertaspis gemmiventris* and the blind snake *Typhlops decorosus*. Mt. Cameroon appears not to have any strictly endemic reptile species. The high number of reptiles recorded at this site highlights its significance in terms of biological diversity. Sound conservation measures through the erection of the proposed areas to forest reserves could maintain this high diversity while integrating the needs of agricultural companies and local people farming around the area.

Resume.—Lors d'une étude des reptiles de la région du Mont Cameroun, nous avons répertorié 74 espèces de reptiles appartenant à 49 genres et 14 familles ; on peut y ajouter 12 espèces supplémentaires, qui ont été récoltées dans la zone dans le passé, mais que nous n'avons pas retrouvées lors de notre travail. Ce total de 86 espèces, qui représente plus du tiers des espèces connues dans le pays, fait du site étudié l'un des plus riches en biodiversité au Cameroun. La forêt dense de basse altitude comporte le plus grand nombre d'espèces (58), suivie par la forêt submontagnarde (45) puis par la forêt montagnarde (21) et 4 espèces marine. Plusieurs espèces de reptiles rares ou peu connues ont été rencontrées dans la région, telles que le scincidé *Lacertaspis gemmiventris* et le typhlopidé *Typhlops decorosus*. Contrairement à ce qu'on observe pour plusieurs autres massifs montagneux de la dorsale camerounaise, il ne semble pas y avoir d'espèce de reptile réellement endémique du Mont Cameroun. Le grand nombre de reptile enregistré dans cette localité reflète sa richesse en diversité biologique. Des mesures de conservation par érection des zones proposées comme réserve forestières peuvent permettre de maintenir cette richesse biologique en intégrant les besoins des industries agricoles et de la population locale de la région.

Key words.—Western Cameroon, reptiles, biological diversity, conservation.

Due to its varied landscape, the mountainous regions of western Cameroon are home to a large number of reptile species. The Mt. Cameroon area has many of the habitats typical of this part of Cameroon including mangroves and low swampy mangroves, lowland forests, highland forests, highland grasslands and highland gallery forests. The area is

considered significant for biodiversity as there are more than 6000 species of plants and a variety of animals, some of which are endemic and/or rare species (Tanyi 1998). Despite such a high biodiversity, Mt. Cameroon is not a protected area and has no formal management plan. The economic activities of the region include farming, plantation agriculture, timber extraction, hunting and coastal fishing. Due to the fertile nature of the volcanic soils, there is high demand of land for agriculture and the impact of large scale plantation agriculture is significant in the region. This is likely to have a considerable impact on biodiversity as new lands are cleared every year for agriculture - oil palm and rubber plantations of the Cameroon Development Corporation (CDC), and also for small-holder farming for food and cash crops.

The reptiles of the montane forest on Mt. Cameroon are poorly known. A number of researchers (Boulenger 1887a,b; Boettger 1889; Bucholz & Peters 1876; Werner 1898; Sternfeld, 1908, 1909, 1910a,b; Müller 1910; Nieden 1910a,b; Mertens 1938, 1939, 1940; Monard 1951), have searched for characteristic, rare and new species in Cameroon and while some of them worked in Mt. Cameroon (in particular Mertens 1939) none have detected strictly endemic species there.

To determine which species of reptiles are present around Mt. Cameroon, the Mt. Cameroon Project and CAMHERP Project undertook a one year inventory of reptiles between February 2001 and March 2002.

A check list is compiled for the region and the conservation status of certain species is discussed.

MATERIALS AND METHODS

Study area.—Mount Cameroon lies on the coast in the Southwest Province of Cameroon. At

4095 m it is the highest mountain in west and central Africa. This massif is part of an extensive volcanic mountain range that includes a number of offshore islands and extends inland to the Bamenda and Adamawa Highlands (Figure 1). The main body of Mt. Cameroon is roughly elliptical, 45km long and 30km wide (Tame 1999), and occupies an area of about 1,500 km² (Tchouto 1995). It is an active Hawaiian type volcano of Quaternary origin, without a central crater, subject to continued fissure eruptions on the flanks of the mountain (Payton 1993). The slopes are steep and rugged and marked by lava flows and volcanic cones (Tame 1999).

The mid slopes of the south and east of Mt. Cameroon receive high rainfall (up to 10,000 mm/year near Debuncha). To the north rainfall is only 1,700 mm/year. There is a short dry season between December and February, but humidity remains high at about 75–80% throughout the year (Payton 1993).

Mount Cameroon has a relatively unbroken sequence of natural vegetation from lowland evergreen forest at sea level to sub-alpine prairies near its summit (Acworth *et al.* 1996). The exceptional plant species diversity of Mt. Cameroon has been well discussed by several authors (notably Maitland 1932; Bougley 1955; Letouzey 1968; Thomas & Cheek 1992) and is a result of the wide range of physical and climatic factors such as volcanism, altitude, geology and rainfall (Tchouto 1995).

In addition to the marine environments off the coast, five natural vegetation belts are recognised on the slopes of the mountain (Thomas & Cheek 1992) and zonation is determined primarily by elevation:

— lowland evergreen belt (<1500m a.s.l) is characterised by guinea-congolian lowland evergreen forest and also includes mangrove areas

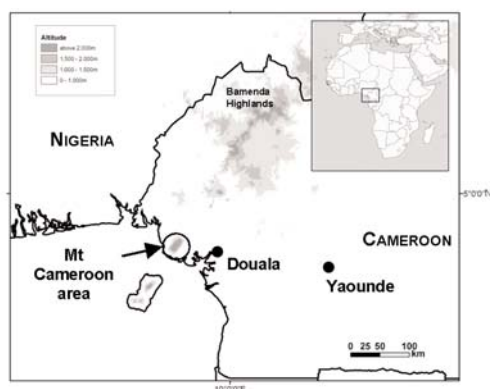


Figure 1. Western Cameroon showing the Mt. Cameroon region.

— submontane belt (1500-1800m a.s.l) has forest with discontinuous canopy

— montane belt (1800m-3000m a.s.l.) has a mixture of montane forest and grasslands with the tree line occurring between 2000 and 2500m. Frequent burning and volcanic activity helps maintain this tree line (Tchouto 1995). The montane forest at this level is characterised by afro-montane species with wide distribution mixed with montane endemic species from both montane and lowland genera (Tchouto 1995)

— sub-alpine belt (3000-4000m a.s.l) is characterised by low tussock grasses with very limited development of woody vegetation

— alpine grassland above 4000m a.s.l. has reduced fauna and flora and supports only 32 species of vascular plants (Tame 1999).

Surveys.—Field work was carried out between February 2001 and March 2002 during both rainy and dry seasons.

Reptiles were located by active searching by trained herpetologists and assistants in all types of habitats. Search techniques included visual

scanning of microhabitats and lifting of rocks and logs, peeling away exfoliating layers of tree backs, moving fallen debris and inspecting tree stems in all surveyed habitats. A small hand-held torch was used to look into cracks and holes in logs and rocks. Some searches were undertaken at night along randomly selected forest paths in trees and houses, again using a torch. Logs and rocks were restored to minimise habitat alteration. When seen, lizards were collected by hand (lizards) and snakes using a stick or 1.5m long tong manipulated by a trigger-grip to secure snakes behind the head. Animals were kept in cloth bags and small plastic containers lined with moistened moss. Well known species were immediately released at the point of capture and notes on habitat, altitude and number observed were recorded. No more than 5 voucher specimens were collected for species not easily identified. Collections were made from 31 localities (Appendix 1) with the assistance of farmers in 15 villages who preserved reptiles killed on their farms (mostly snakes) in 5 litre plastic bottles or buckets half-filled with unbuffered 10% formalin. Carapaces of turtles and tortoises are often retained in the village after being eaten, and were collected or noted during village visits. Specimens were identified using various references including, geckos: Loveridge (1947), van den Audenaerde (1967) and Perret (1963, 1986); *Mabuya*: Hoogmoed (1974), Chirio and Ineich (2000), chameleons: Klaver and Böhme (1992), Wild (1993); and snakes: Chippaux (2001), Meirte (1992) and Roux-Estève (1974).

The habitat of each specimen was recorded as per the vegetation categories above. The list obtained (Table 1) is a compilation of the data from the different habitat types using the various sampling methods. The surveyed habitat types varied in size with the lowland area covering a larger surface area followed by the submontane and montane habitats. Sampling efforts varied accordingly which resulted in more time and collections in the lowland area.

Table 1. List of reptiles recorded from the Mt. Cameroon region. Frequency categories: A: abundant; M: moderately abundant; R: rare.

Family	Species	Abundance	HABITAT				Literature record
			Marine	Lowland forest (< 1500m)	Submontane forest (1500 – 1800m)	Montane forest (1800-3000m)	
Crocodylidae	<i>Crocodylus niloticus</i> * <i>Osteolaemus tetraspis</i> *						Stucki-Stern, M.C (1979)
Testudinidae	<i>Kinixys erosa</i> <i>Kinixys homeana</i>	A M		X X			
Cheloniidae	<i>Chelonia mydas</i> <i>Eretmochelys imbricata</i> <i>Lepidochelys olivacea</i>	R R R	X X X				
Dermochelyidae	<i>Dermochelys coriacea</i>	R	X				
Gekkonidae	<i>Cnemaspis koehleri</i> * <i>Cnemaspis spinicollis</i> <i>Hemidactylus brooki angulatus</i> <i>Hemidactylus echinus</i> * <i>Hemidactylus fasciatus fasciatus</i> <i>Hemidactylus ansorgi</i> <i>Hemidactylus longicephalus</i> <i>Hemidactylus m. mabouia</i> <i>Hemidactylus muriceus</i> <i>Hemidactylus richardsoni</i> *	M M M M M R A R		X X X X X X X X	X X X X X		Mertens (1937) Loveridge (1947) Perret (1963) Loveridge (1947)
	<i>Lygodactylus fischeri</i> <i>Lygodactylus conraui</i>	M M		X X	X X		
Agamidae	<i>Agama agama</i> <i>Agama sylvanus</i>	A A		X X	X X	X X	
Chamaeleonidae	<i>Chamaeleo cristatus</i> <i>Chamaeleo camerunensis</i> <i>Chamaeleo montium</i> <i>Chamaeleo oweni</i> <i>Rhampholeon s. spectrum</i>	M R A R A		X X X X X	X X X X	X X	
Scincidae	<i>Feylinia currori</i> <i>Lacertaspis gemmiventris</i> <i>Lacertaspis rohdei</i> <i>Leptostaphos vigintiserierum</i> * <i>Lygosoma fernandi</i> <i>Melanoseps occidentalis</i> <i>Panaspis breviceps</i> <i>Trachylepis affinis</i> <i>Trachylepis albilabris</i> <i>Trachylepis maculilabris</i> <i>Trachylepis polytropis</i>	R A M M R R M A R A M		X X X X X X X X X X	X X X X X X X X	X X X X	Gartshore (1986)
Varanidae	<i>Varanus ornatus</i>	R		X	X		
Typhlopidae	<i>Typhlops sp.</i> <i>Typhlops congestus</i> <i>Typhlops decorosus</i>	R R R		X X X	X X		
Pythonidae	<i>Calabaria reinhardti</i> <i>Python sebae</i>	M R		X X	X X		

Table 1 continued.

Family	Species	Abundance	HABITAT			Literature record
			Marine	Lowland forest (< 1500m)	Submontane forest (1500 – 1800m)	
Colubridae	<i>Afonatrix anoscopus</i>	R		X		
	<i>Boiga blandingi</i>	M		X		
	<i>Boiga pulverulenta</i>	M		X	X	X
	<i>Bothrolycus ater</i>	R		X		
	<i>Bothrophthalmus lineatus</i>	M		X	X	
	<i>Bufo d. depressiceps</i>	R			X	
	<i>Chamaelycus fasciatus</i>	R			X	
	<i>Dasyplepis fasciata</i>	A		X	X	
	<i>Dendrolycus elapoides*</i>					Perret (1961)
	<i>Dipsadoboa viridis viridis</i>	M		X		
	<i>Grayia smithi*</i>					Stucki-Stirn (1979)
	<i>Grayia ornata</i>	M		X		
	<i>Hapsidophrys lineatus</i>	A		X		
	<i>Hapsidophrys smaragdina</i>	A		X		
	<i>Lamprophis lineatus*</i>					Stucki-Stern, M.C (1979),)
	<i>Lamprophis olivaceus</i>	A		X	X	
	<i>Lamprophis virgatus</i>	M		X	X	X
	<i>Lycophidion laterale</i>	M		X	X	
	<i>Mehelya savorgnani</i>	R		X		
	<i>Mehelya guirali</i>	R		X		
	<i>Mehelya poensis</i>	M		X		
	<i>Mehelya stenophthalmus</i>	M		X	X	
	<i>Natriciteres fuliginoides</i>	M		X		
	<i>Philothamnus carinatus</i>	M		X	X	
	<i>Philothamnus heterodermus</i>	R			X	
	<i>Philothamnus nitidus*</i>					Stucki-Stern (1979)
	<i>Psammophis phillipsi*</i>					Lawson (1993)
<i>Rhamnophis aethiops</i>	R		X			
<i>Rhamnophis batesi</i>	R		X			
<i>Thelotornis kirtlandi</i>	R		X			
<i>Thrasops flavigularis</i>	A		X	X		
Elapidae	<i>Dendroaspis j. jamesoni</i>	M		X	X	X
	<i>Pseudohaje goldi</i>	R			X	
	<i>Naja m. melanoleuca</i>	A		X	X	X
Viperidae	<i>Atheris squamiger</i>	M		X	X	X
	<i>Bitis gabonica</i>	A		X	X	X
	<i>Bitis nasicornis</i>	A		X	X	X
	<i>Causus lichtensteini*</i>					Böhme (1975)
	<i>Causus maculatus</i>	M			X	
Atractaspididae	<i>Aparallactus m. modestus</i>	M		X	X	X
	<i>Atractaspis reticulata heterochilus</i>		R			X
	<i>Polemon c. collaris</i>	R		X		

* Not recorded during the study, but reported in literature.

The relative abundances provided in Table 1 are based on the combined data of specimen observations and the voucher specimens collected in each habitat. We followed a subjective classification (see Duellman 1965, Lawson 1993) in designating the frequency categories as A: abundant M: moderately abundant and R: rare. As our method is probably biased in favour of certain species, our classification of relative abundance varies among taxa. For turtles, tortoises and lizards, we ranked: 3, or fewer specimen = rare; 4 – 10 = moderately abundant; >10 = abundant. For Snakes: 1 specimen = rare; 2 -5 = moderately abundant; > 5 = abundant.

Voucher specimens collected in the course of the study were deposited at the Muséum national d'Histoire naturelle, Paris (MNHN).

Reptilian faunal comparisons performed in this study were compiled primarily from published lists from Cameroon and other west and central African sites.

RESULTS AND DISCUSSION

A total of 74 species of reptiles (Table 1) from 14 families and 49 genera were recorded during the research period. This represents about 30% of the estimated Cameroon reptile fauna of 283 species. Species recorded included 6 species of turtles/tortoises, 27 lizards and 41 snakes. No species of crocodile or freshwater tortoises were recorded in the area, though both undoubtedly occur as locals from the villages of Bavenga and Boando (Appendix 2) indicated that they have collected the species in the area for local consumption. Muller (1910) recorded specimens of *Crocodylus niloticus* and *Osteolaemus tetraspis* from Buea. Freshwater tortoises known from the area include: *Pelusios gabonensis* (Perret & Mertens 1957), *P. niger* (Mertens 1938).

During field work, we personally observed 41 species while a further 33 species were recorded from preserved specimens obtained from local collectors. This illustrates the importance of collaborating with locals for reptile survey work with limited time. Without such collaboration a considerable number of species would not have been recorded.

The lowland forest was the most species rich habitat (58 species), followed by submontane forest (45 species), montane forest (21 species) and marine habitats occurring adjacent to the study area (4 species). No reptiles were found in the subalpine and alpine belts in four days of field surveys. Twenty-four species (33% of total number) were found exclusively in lowland forest, and 17 species (23%) were captured in three habitat types (lowland forest, submontane forest, and montane forest).

The comparatively high reptile species diversity in the lowlands might be explained by the easy access and high number of collection villages (14) compared to 1 (Etome) in the submontane habitat and none in the montane zone (no villages are found in this area). Additionally, a high number of surveyed sites were in the lowland area (15) and the more extensive nature of this habitat and the greater number of sub habitats, e.g. mangroves, which are absent in higher altitude habitats may also explain the discrepancy. Most of the reptiles recorded in the submontane and montane habitats are also known from the lowland habitats, no species strictly endemic to Mt. Cameroon were recorded and only two regional montane endemics (*Chamaeleo montium* and *Lacertaspis gemmiventris*) were recorded. Mount Cameroon supports fewer montane endemic species than the other mountains along the Cameroon mountain range. The fact that Mt. Cameroon is the only active volcano in Cameroon with the most recent eruption in 2000 may help to explain this difference. Additionally, the lack of permanent water at

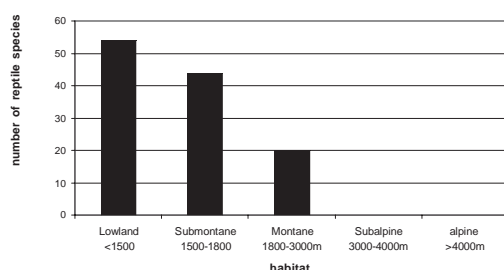


Figure 2. Number of reptile species recorded from habitats in the Mt. Cameroon area.

higher elevations on the mountain (Mann Spring being the highest water source at 2300m a.s.l.) may indirectly affect species richness]. Figure 2 shows the decrease in reptile species richness with increasing elevation.

COMPARISON WITH OTHER SITES IN CAMEROON

With a total of 86 reptiles species found on and around Mt. Cameroon (74 species recorded during the survey and 12 species known from literature – see Table 1), the reptile fauna is among the richest recorded in Cameroon. A recent survey conducted around Mt. Nlonako (Herrmann *et al.* 2005) revealed 89 species of reptiles, representing the highest number of reptile species known from a single locality. Within Cameroon, Mt. Cameroon ranks second with 86 species followed by Korup National Park with 83 species (Lawson 1993) and the Takamanda Forest Reserve with 71 species (LeBreton *et al.* 2003). For comparison, other highly diverse reptile faunas in Central Africa include 109 species from the Virunga National Park, Democratic Republic of Congo (DRC) (DeWitte 1941; Laurent 1972) and 74 species from Garamba National Park, DRC (DeWitte 1966; Inger 1968).

Our comparison of the check lists reveals 53 of the species are shared between Mt. Cameroon

and Mt. Nlonako. Mount Cameroon is found just 110km southwest of Mt. Nlonako, and the areas share many similar habitats. Two other sites in Southwest Cameroon: Korup National Park (Lawson 1993) and Takamanda Forest Reserve (LeBreton *et al.* 2003) share about 50 and 57 of their species with Mt. Cameroon respectively. These areas are found about 80km and 150km North of Mt. Cameroon and share a number of characteristics with Mt. Cameroon. Takamanda in particular includes a range of habitats from lowland rainforest, mid-elevation forest, montane forest and elevated savannah. Korup N.P. which is closer to Mt. Cameroon had a slightly lower number of species in common as it has mostly tropical lowland forest with limited areas of elevated forest.

Within the Central African sub region, Mt Cameroon shares 31 species with the Virunga National Park and 20 species with the Garamba National Park (Democratic Republic of the Congo).

The diversity of snakes in the Mt. Cameroon area (41 species) represents about 28% of all snakes species known to occur in Cameroon (estimated at 150 species, Gonwouo *et al.* 2005). This relatively high diversity is similar to other Cameroon sites: 63 snake species from Mt. Nlonako (Herrmann *et al.* 2005); 54 snake species from Korup NP (Lawson 1993) and 42 species from the Takamanda Forest Reserve (LeBreton *et al.* 2003). Other snake-rich sites in Africa include Mt. Nimba in Guinea, 52 species (Ineich 2003); Dimonika, Republic of Congo, 45 species (Trape 1985); Tai National Park, Ivory Coast, 40 species (Ernst & Rödel 2002) and Kibale National Park, Uganda, 37 species (Vonesh 2001).

Twenty seven lizard species were recorded around Mt. Cameroon which seems high in comparison with low numbers recorded elsewhere in West Africa (Böhme 1994; Rödel *et al.* 1997): 8 species from Haute Dodo and

Cavally Forest, Ivory Coast (Branch & Rödel 2003) and 15 species from Mt. Nimba, Guinea (Ineich 2003). In Cameroon, however, there are generally more than 20 species of lizards in forest sites: 28 species from the Takamanda Forest Reserve (LeBreton *et al.* 2003); 23 lizard species from Mt. Nlonako (Herrmann *et al.* 2005) and 22 species for the Korup N.P. (Lawson 1993). Despite the high number of reptiles recorded at the site, only 2 regional montane endemic reptile species (*Chamaeleo montium* and *Lacertaspis gemmiventris*) are known from Mt. Cameroon as compared to 10 species from Mt. Nlonako (Herrmann *et al.* 2005). The Mt. Nlonako region including the adjacent Mt. Manengouba that has long been recognised as one of the “hottest” hotspots of the world biological diversity (Myers *et al.* 2000) due to its exceptionally high species richness and endemism probably resulting from its history as an ancient Quaternary refuge for forest communities (Gartshore, 1986; Maley 1987; Pook & Wild 1997; Stattersfield *et al.* 1998; Rödel *et al.* 2004).

NOTES ON SELECTED SPECIES

The forest hinge-back tortoises (*Kinixys erosa* and *K. homeana*) are widespread in the lowland forest region of Cameroon. In villages in the Mt. Cameroon area the shells of *K. erosa* are more commonly encountered than those of *K. homeana*. Both species are collected and eaten by local hunters whenever encountered, and the shells are often kept as household decorations. In the Banyang-Mbo area to the north of Mt. Cameroon levels of hunting appear to be unsustainable with annual harvests of up to 0.7 *Kinixys* per Km² (Lawson 2000), however for the moment there still appear to be some moderate tortoise populations around Mt. Cameroon. As in the Banyang-Mbo area collections may also be unsustainable in the long term.

Four species of marine turtles were recorded from villages along the coast near Mt. Cameroon (*Chelonia mydas*, *Eretmochelys imbricata*, *Lepidochelys olivacea* and *Dermochelys coriacea*). All records were of carapaces retained by fisherman after butchering. We obtained no information on numbers being collected (see Fretey 2001).

The mountain chameleon (*Chamaeleo montium*) seems to be uncommon around Mt. Cameroon in mature secondary forests (mean of 9.60 specimens per transect hour) (Gonwouo *et al.*, 2006) and local populations may be threatened by over-collection for the international pet trade. This activity is significant in the area with collections being undertaken in six local villages for both international and Cameroonian dealers. Chameleons are collected during night excursions on the mountain and during daily activities around the site. Specimens are stocked in cages and sold to dealers who frequently visit the region. We recorded a post capture mortality of up to 25% locally (Gonwouo *et al.* under review).

An unusual feature of Mt. Cameroon compared to other peaks in Cameroon is the absence of the other montane endemic chameleons, such as *C. quadricornis* and *C. pfefferi* found on neighbouring Mts. Kupe and Manengouba. However, *Chamaeleo camerunensis* a species endemic to the lowland areas of coastal Cameroon is present. A male specimen was collected by one of us in April 2007 and tissue collected to permit comparisons with other members of the genus (Ineich *et al.*, in prep.). The lack of other endemic chameleons may be explained by the unstable volcanic nature of Mt. Cameroon with ash falls from recent eruptions removing all foliage from large areas on the flanks of the mountain. *Chamaeleo montium* appears to prefer modified habitats such as farms and secondary forests < 2000m perhaps making it more adaptable to such events. This species, as well as other endemic highland

species (*C. pfefferi*, *C. quadricornis* and *C. wiedersheimi*), are probably derived from the lowland species *C. cristatus* (Böhme & Klaver 1981). The present high altitude distribution of many species of chameleons of the genus *Chamaeleo* and other herpetofauna of the submontane forests suggests that this cool forest was more extensive in the past. On Mt Cameroon the contraction and expansion of this zone may have occurred several times with its south-facing slopes receiving full force of moisture from winds of the ocean up to date (Gartshore 1986).

Cnemaspis spinicollis is a small gecko restricted to rocky outcrops in closed forest and was found at a number of sites. It may be sensitive to habitat alteration such as opening of the canopy and exposure of outcrops.

The gecko, *Hemidactylus ansorgi*, is most frequently encountered in primary forest on the bark of trees, but can also be found in secondary forest and in rare cases farm bush/plantations. It appears to be displaced by *H. mabouia* in increasingly disturbed sites.

The *Hemidactylus muriceus* group remains somewhat confusing. A number of closely related species have been recently described (Bauer & Pauwels 2002; Henle & Böhme 2003), however identification of species in the field remains difficult. One specimen perhaps referable to *Hemidactylus muriceus* was captured in a hollow of a tree trunk at about 50cm above the ground at night.

Lacertaspis gemmiventris is only known from the Mt. Cameroon area, the Banyang-Mbo Wildlife Sanctuary in Cameroon (Diffo & LeBreton 2003) and Bioko, Equatorial Guinea (Gartshore 1986). Two individuals were observed on a tree trunk at about 2m above the ground on the north-west flank of Mt. Cameroon at 1800m. While this species has a very restricted geographic range, it can be seen

in disturbed forest and farm bush. *Lacertaspis rohdei* is much more widespread and was found to be very common in leaf litter in forests between 600 and 1900m. At lower altitudes, *Panapis breviceps* was collected between 100 and 600m. This latter species occurs throughout African lowland equatorial rain forest.

The blind snake *Typhlops decorosus* was previously known from only four specimens in Cameroon (Roux-Estève 1974). It was recorded in Bova village near Buea at 1000m.

Some uncommon forest snakes recorded during this study included: *Bothrolycus ater*, *Chamaelycus fasciatus* and *Lycophidion laterale*. Another uncommon species not found during our field work was *Dendrolycus elapoides*, however it was recorded from Mt. Cameroon by Perret (1961). While these species appear to be rare in collections, they are widespread in the forested region of central Africa.

Three species of elapids were recorded. *Dendroaspis j. jamesoni* and *Naja m. melanoleuca* were widespread and common. The latter has been recorded as the most encountered venomous snake in Cameroon (Gonwouo *et al.* 2005). *Pseudohaje goldi*, found in only two sites was the rarest elapid snake recorded.

Bitis gabonica and *Bitis nasicornis* are the two largest species of vipers in the area and are fairly common. They are often killed and eaten when encountered in primary forest patches and farm bushes. Both species are known to co-exist in farm bush habitats (Lawson 1993) where most observations were made.

CONCLUSIONS

The present data will serve as a basic tool for future research and monitoring in the Mt.

Cameroon area. The Mt. Cameroon area harbors more than one third of all reptiles known to exist in Cameroon, with most being typical forest species. The only two regional montane endemic species recorded were *Chamaeleo montium* and *Lacertaspis gemmiventris* and despite much field work over the years it appears that Mt. Cameroon has no strictly endemic reptiles, unlike other massifs along the Cameroon mountain range.

Much of the land around Mt. Cameroon is being converted by agricultural companies and locals for farming and settlement. This is likely to have a negative effect on the regional endemic species known from this site. On the other hand, cleared areas such as farm bush, plantations and gardens on Mt. Cameroon tend to harbor a number of widespread, invasive reptile species such as *Agama agama* and *Trachylepis maculilabris*, while intact forest and small forest clearings provide habitat for the majority of the species occurring in the area. Continued encroachment of farming into primary forest may eventually decrease the occurrence of some of the rare or infrequently encountered forest species depending on forest clearings.

A number of species present may be locally threatened by over hunting, these include the terrestrial tortoises *Kinixys erosa* and *K. homeana* and the sea turtles *Chelonia mydas*, *Dermochelys olivacea*, *Eretmochelys imbricata* and *Lepidochelys olivacea*. The first two are Data Deficient and recorded in the IUCN's Red list. Insufficient data exist as regard their ecology and distribution to assess their conservation status. Chameleons on the other hand appear to be under heavy collection pressure for international pet trade, with the proximity of Mt. Cameroon to Cameroon's main port and largest city, Douala, facilitating the export of such commercial species.

Despite the high reptile diversity recorded on and around Mt. Cameroon, the area has no protected areas and as such may need special measures or interventions to prevent overexploitation of species and habitat destructions. Researchers have suggested that the Mt. Cameroon area and its rich diversity is of international significance and some have argued that it should be designated a National Park (Collar & Stuart 1988) or a World Heritage site (Oates *et al.*, 2004).

Despite its significance, currently no parts of this region are strictly protected though the flanks and foothills of the mountain contain several Forest Reserves, including Bambuko, Mokoko River, and Southern Bakundu. Several new forest reserves have also been proposed, including Etinde, Mabeta-Moliwe, and Onge. Mokoko and Onge in the western foothills constitute the most intact and extensive lowland forest area. The protection of part of the Mt. Cameroon area for nature conservation, will significantly enhance conservation of reptile communities over the long term and also create one of the most accessible and iconic national parks in central Africa. Such a park could play a central role in the development of new nature conservation awareness in Cameroon.

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