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The reptiles of the summits of Mont Oku and the Bamenda Highlands, Cameroon*

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***Abstract.*—The list of the non-avian reptiles occupying the summits above 1,400 m elevation of Mount Oku and the Bamenda Highlands in Cameroon comprise 50 species (one tortoise, 18 lizards, and 31 snakes) belonging to 12 families and 29 genera. This assemblage has a high biogeographic interest because it harbors species with a large altitudinal spectrum and several high elevation endemic forms (submontane). Those species are currently severely threatened by human expansion in the area. Human impacts include direct collections of several endemic species with a high commercial value for the international pet trade, but most importantly deforestation and the growing encroachment of people, cattle, and agriculture. Efficient actions are urgently needed to preserve this unique heritage for future generations.**

Key words. Biogeography, conservation, biodiversity, afro-montane herpetofauna

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Introduction

African mountain formations clearly show an island-like distribution pattern, which explains their high biogeographical disposition and the importance of those mountain ranges for the conservation of their distinctive fauna (Gartshore 1986; Fjeldsa and Lovett 1997). The Cameroon Volcanic Dorsal extends in its southern part for 800 km, and is represented by a succession of insular-like reliefs (true or continental islands). It begins with the island of Annobón (elevation 655 m; Equatorial Guinea), located more than 360 km from the African mainland, and extends through the islands of Sao Tomé (2,024 m), Principe (948 m) and Bioko (formerly called Fernando Poo; 3,106 m). It continues on to the mainland, including the highest volcanic summit of Western Africa, Mount (Mt.) Cameroon, which rises to 4,085 m. North of Mt. Cameroon, emerge Mt. Nlonako (1,822 m), the important volcanic range of Manengouba (2,411 m), and the reliefs of the Bakossi Highlands. North of those first reliefs stands an imposing orographic set which includes most of the Highlands generally called the Bamenda Highlands (BH). Towards the south it starts with a large and elevated volcanic edifice, the Bamboutos Mountains (2,740 m). Through the Santa Range (Mt. Léfo or Peak of Santa, 2,550 m elevation), the Bamboutos Mountains connect to the main peak, Mt. Oku, at 3,011 m. Elevations then decrease relatively quickly before joining the northern part of the Cameroon Volcanic Dorsal that ends with the Tchabal Mbabo (2,460 m). The relief then undergoes an eastern shift in their orientation, to fit the septentine border of the Adamaoua, with the smaller peaks of Mt. Alantika (1,885 m) and Mt. Mandara (1,442 m) separated by the depression of the Benoue valley, which does not exceed 150 m elevation.

The central axis of the Cameroon Volcanic Dorsal has lateral extensions including more or less important bastions, including on the western flank, Mts. Rumpi (1,764

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*This paper was written in homage to our late colleague and friend Dr. Odile Bain (CNRS, MNHN).

m) and in Nigeria, Sonkwala (also called Obudu Plateau) and Gotel (2,418 m). In the east stand Mts. Bana (2,097 m), Mbapit (1,989 m), Nkogam (2,263 m), and Mbam (2,335 m). The majority of these mountains truly function like islands for orophilous species because their elevation is substantially higher than surrounding territories of low elevation (at most 100 m), thus usually prohibiting the faunal exchange of climatically demanding, orophilous species between neighboring mountain ranges.

To the northeast of the Cameroon Volcanic Dorsal rests the largely tabular area of the Adamaoua, a vast middle mountain barrier extending from east to west. Mean elevation of that central Cameroon relief stays relatively low (about 1,100 m), but is contiguous with the high western ranges and functions as a faunistic exchange corridor, creating a zone of biogeographical interest. It is indeed increasingly recognized that under the colder climate of the Plio-Pleistocene climatic oscillations, the Adamaoua represent a refugia, an efficient "hyphen" between the Cameroon Volcanic Dorsal and the mountains scattered across the eastern edge of the Congo Basin in Eastern Africa (Wagner et al. 2008; Barej et al. 2011). Some imposing volcanic relief is strewed on the Adamaoua Plateau, especially towards its septentine rim. The most important, about 40 km east of the city of Ngaoundere, is the Hossere Nganha, which reaches 1,923 m elevation and is a location where some endemic species of reptile and amphibians are encountered (Amiet 1971; Ineich and Chirio 2004).

In Cameroon, the highest peaks (above 2,000 m) are located at Mt. Cameroon, Mts. Bamboutos, Mt. Oku, and at Tchabal Mbabo. With the exception of Mt. Cameroon, those formations have been significantly degraded by man and most often comprise only forest remnants within montane grasslands grazed by the abundant cattle of the Fulani herdsmen (Fig. 1).

Mt. Oku (rarely called Mt. Kilum: 6.12°N and 10.28°E, elevation 3,011 m) is located in the most septentine part of the BH, not far from the transition zone between mountain forest and savanna. Summits above 2,800 m are covered with an afro-alpine grassy lawn (Fig. 1), devoid of trees, in which there is even a bog. The north side is home to one of the best-preserved mountain forest fragments in the region (Figs. 2, 3). An associated vegetation is also found there including wet mountain forests, which are well developed around Lake Oku (6°12'N and 10°27'E), and a crater lake located about 2,300 m above sea level. Another lake, Lake Bambili (5°56'N and 10°15'E), is present in the region. Cattle herds are common around the massif and even into the montane forest protected areas. These forests are important elements in the economy and local culture as they allow the production of a wide range of forest products essential to the survival of local populations (wood, honey, and medicinal plants, e.g., *Prunus africanus* used in the treatment of prostate cancer and subjected to strict control by the Washington Convention on International Trade of Endangered Species) (Figs. 4, 5). Scared and felled trees are visible even in the forest reserves, and caused by the overflow of human activity along the many forest paths and trails that allow easy access (Macleod 1987) (Fig. 2).

This report provides a critical inventory of the reptile species recorded from the summit area (above 1,400 m elevation) of the BH, demarcated by the valley that separates it from Manengouba/Mt. Cameroon (less than 700 m) and the Tikar Plain that separates it from Tchabal Mbabo (Fig. 6). We also discuss the biogeographic affinities of the study region. Many of the reptiles found there are

Fig. 1. The beautiful cattle of the Fulani herdsmen observed on pastures high in the region of Mt. Oku are fat and healthy. 6.21°N and 10.44°E. *Picture: I. Ineich, May 8, 2007.*

Fig. 2. The path leading from Oku Elak village to the summit of Mt. Oku is very popular and easy to access. *Picture: I. Ineich, May 6, 2007.*

Fig. 3. Just before the summit of Mt. Oku, the vegetation is covered with dense epiphytic altitude plants. *Picture: I. Ineich, May 6, 2007.*

Fig. 4. Villagers apply strong pressure on the fauna and flora of Mt. Oku forests. It is common to find traps to catch bush meat, here a brush-tailed porcupine (a forest porcupine species). *Picture: I. Ineich, May 6, 2007.*

Fig. 5. Hives, placed high in the trees almost to the top of Mt. Oku (here), produce a thick, white honey of excellent quality, highly sought after. *Picture: I. Ineich, May 7, 2007.*

endemic mountain species whose distribution is restricted and unfortunately now highly fragmented. Our knowledge of this herpetofauna has been greatly improved by field work undertaken under the CamHerp project which ultimately resulted in the publication of a complete Atlas of the reptiles of the country (Chirio and LeBreton 2007). The BH, as defined above, hosts 50 non avian reptile species among which 16 are endemic to our study area.

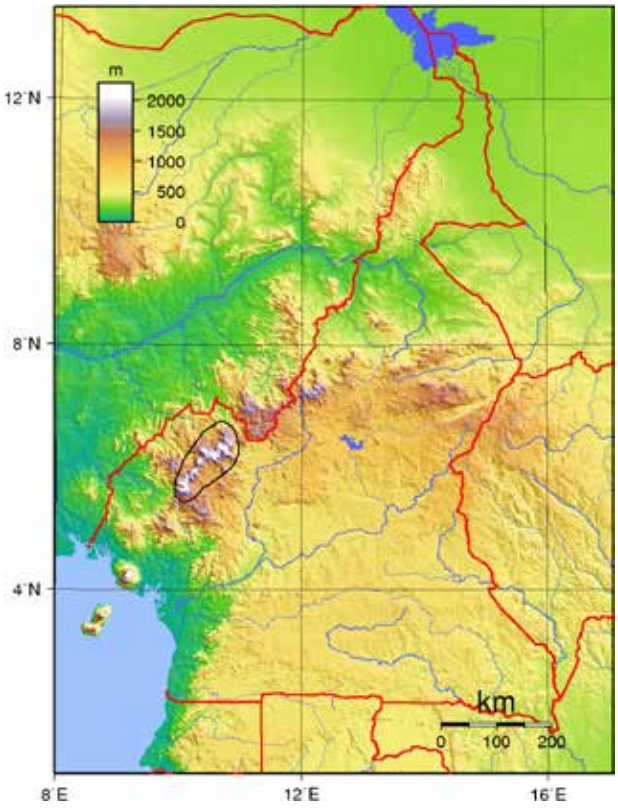

Fig. 6. Map of Cameroon with the geographical area of the mountain range (circled in black) retained as part of this study. Country boundaries are shown in red.

Others overflow very locally into neighboring Nigeria (Obudu plateau and Mts. Gotel), the Central African Republic (eastern borders of the Adamaoua), or Equatorial Guinea (Bioko Island). Only one snake species, *Dipsadoboa unicolor*, is also present in Eastern Africa. The mountain biodiversity is thus relatively low but the level of endemicity is quite high. All of the area undoubtedly represents significant challenges to preserve the richness and originality of the endemic afro-montane herpetofauna. The regions studied here represent a much drier area than the larger mountains such as Mt. Cameroon located southwest on the Cameroon Volcanic Dorsal. The herpetofauna includes common species, in addition to taxa more restricted to these formations and their climate. Other studies on the altitude mountains of the Cameroon Volcanic Dorsal ridge have produced impressive species lists, but unlike our study (only 50 species found above 1,400 m), they also include herpetofauna from the base of the mountain ranges (Herrmann et al. 2005, 2006).

Inventory of Taxa Present in the Study Area

Below we discuss all species of non-avian reptiles reported from the BH above 1,400 m (Fig. 6) from our collection (total 374 specimens), including our observations and/or data available in the literature. We include chelonians (one specimen available), lizards (266 specimens), and snakes (107 specimens). In each of these groups

we deal with the species alphabetically, by family, and by taxa in families, in alphabetical order. We indicate the list of available specimen(s) in the MNHN-RA collections (Muséum national d'Histoire naturelle, Reptiles and Amphibians collections, Paris), that originate mainly from collections made during the CamHerp project. Note, however, that only a subset of CamHerp lizards have been entered into MNHN collections, while most snakes have not been accessioned in to the MNHN-RA yet and only field tag details (CamHerp xxx) are given.

CHELONIANS

Testudinidae Gray, 1825

Kinixys homeana Bell, 1827 (One specimen)

Material: CamHerp 121 (Mboh village, 6.327°N and 10.348°E, elev. 1,800 m, coll. CamHerp M. LeBreton, July 8, 2002).

This tortoise prefers relatively humid spots, where it seems to feed on mushrooms. It is found in all the western part of Cameroon, from the plain to 1,800 m at Mboh in the BH. The main threat is its frequent use as bushmeat by local people as well as collection for sale in the country's major markets (Lawson 2001; Luiselli and Diagne 2014).

LIZARDS

Agamidae Spix, 1825

Agama agama (Linnaeus, 1758) (Two specimens)

Material: CamHerp 4483I (Boyui village, 6.242°N and 10.311°E, elev. 1400 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – CamHerp 168 (Mbiame, 6.190°N and 10.849°E, elev. 1955 m, coll. CamHerp, December 14, 2002).

This agama is undoubtedly the most anthropophilic species in its group; it occupies almost all the villages in its range but is also common in savanna outcrops and degraded forests. It is present in Bafoussam (elev. 1,500 m), and found from sea level to over 2,000 m on Mts. Bana.

Agama sp. 2 (in: Chirio and LeBreton 2007) (four specimens)

Material: CamHerp 3576X-3579X (4 specimens, Dzindong waterfall, 5.622°N and 10.106°E, elev. 2,350 m, coll. CamHerp M. LeBreton and L. Chirio, May 5, 2001).

This rare and endemic species of Cameroon has not been described yet. It occurs from the Bamboutos and Mbapit Mountains in the BH to Tchabal Mbabo in Adamaoua at altitudes located between 1,900 and 2,350 m at Dzindong waterfall (Chirio and LeBreton 2007).

Agama sp. 4 (in: Chirio and LeBreton 2007) (Nine specimens)

Material: MNHN-RA 1998.0277-0285 (Nine specimens, Mt. Oku, five km north of Oku village, on rocky outcrops, elev. 2,200 m, coll. L. Chirio, June 25, 1998).

This endemic species of Cameroon, identified by Chirio and LeBreton (2007: 172–173), is still not described; it is only known from two mountain stations. It is a large agama living mainly on the rocky outcrops of altitude savannas. It occurs only between 1,900 and 2,000 m above sea level like at the localities of Fungoï and Tabenken.

Chamaeleonidae Gray, 1825

It is only recently that the molecular work of Tilbury and Tolley (2009) demonstrated that the two subgenera of the genus *Chamaeleo* auct., *Chamaeleo* Laurenti, 1768 sensu stricto, and *Trioceros* Swainson, 1839 should be considered as two valid genera. Other studies have subsequently confirmed this (Tolley et al. 2013). Cameroon has great species richness of chameleons (14 species) compared to its neighboring countries. This diversity is mainly located in mountainous areas and is characterized by a high level of endemism. The family is represented by three genera: *Chamaeleo* (five species), *Rhampholeon* Günther, 1874 (at least one species), and *Trioceros* (eight species and three subspecies; Barej et al. 2010). Within *Trioceros*, the most common to occur at elevation include *Trioceros oweni*, the most basal taxon of the genus in Cameroon, *T. camerunensis*, *T. cristatus*, *T. montium*, *T. perreti*, *T. wiedersheimi*, *T. serratus*, *T. quadricornis eisentrauti*, *T. q. quadricornis*, and *T. q. gracilior*. The genus *Rhampholeon* occurs over 1,700 m in Mt. Cameroun but it is curiously absent in the BH. Six species are very clear mountain endemics occupying restricted areas in the Cameroon Volcanic Dorsal mountain ridge. Half of Cameroon chamaeleons are mountain endemics with restricted ranges. A molecular phylogeny of the genus *Trioceros* in Cameroon was established by Pook and Wild (1997) and completed by Barej et al. (2010). Three altitudinal groups in Cameroon can be recognized within the genus *Trioceros*: a plains group (*Trioceros oweni*), a plains and submontane group (*Trioceros camerunensis*, *T. cristatus*, and *T. montium*), and a submontane and mountain group (*Trioceros pfefferi*, *T. perreti*, *T. serratus*, *T. wiedersheimi*, and *T. quadricornis*). Only species of the last group are present in our study area.

Chamaeleo gracilis Hallowell, 1844 (three specimens)

Material: MNHN-RA 2005.3191-3192 (two specimens, Bamessing, 6.004°N and 10.352°E, elev. 1,200 m, coll. CamHerp L. Chirio, October 26, 2000) – MNHN-RA 2005.3590 (Balengu, 5.114°N and 10.450°E, elev. 1,480 m, coll. CamHerp L. Chirio, April 6, 2000).

This species is found in the Ethiopian Rift Valley from 200–1,900 m (Largen and Spawls 2010), whereas in Cameroon it is reported between 5 and 1,775 m above sea

level (Chirio and LeBreton 2007). It was observed but not collected at Bafoussam by one of us (LC, June 22, 2000).

Chamaeleo laevigatus Gray, 1863 (seven specimens)

Material: MNHN-RA 2005.2721 (Fundong, 6.249°N and 10.315°E, elev. 1,500 m, coll. CamHerp, July 8, 2002) – MNHN-RA 2005.3301-3305 (five specimens, Jakiri village along the road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, July 8, 2002) – MNHN-RA 2005.3398 (Awing village (Benjom), 5.867°N and 10.266°E, elev. 1,747 m, coll. CamHerp, M. LeBreton, July 8, 2002).

This species, presently known to occur in Cameroon, was initially mistaken with *Chamaeleo senegalensis* Daudin, 1802 by Chirio and LeBreton (2007), a taxon whose distribution is more western. In East Africa, *C. laevigatus* occurs in moist savanna between 1,000–1,500 m but can fall to 300 m elsewhere (Spawls et al. 2002; Largen and Spawls 2010). It is reported from 350–1,550 m altitude in Cameroon (Chirio and LeBreton 2007).

Trioceros pfefferi (Tornier, 1900) (three specimens)

Material: MNHN-RA 2005.3396 (Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2007.1499 (male; Mt. Oku, Afua, Ijim Forest, western side of Mt. Oku, 6.15°N and 10.40°E, elev. 2,000 m, coll. CamHerp L. Chirio, June 1st, 2000) – MNHN-RA 2007.1500 (female; Bali Ngemba Forest Reserve, 5.825°N and 10.087°E, elev. 1,400 m, coll. CamHerp L. Chirio, June 6, 2000).

This endemic species of the Cameroon Volcanic Dorsal is a typical inhabitant of the wet stations of the western sub-montane forest in the country. It is rare throughout its distribution and was only known from its original description from Nyassosso at Mt. Kupe for nearly a century (Wild 1993). It is found at Mt. Manengouba, and in the BH and Mt. Oku where it reaches almost 2,000 m above sea level. Densities seem higher in populations at Mt. Kupe (Hofer et al. 2003). Altitudinal distribution of the species ranges from 1,200–1,500 m (Schuetze 1998) and 1,100–1,900 m according to Tilbury (2010); the species is reported between 1,100 and 1,900 m from Mt. Kupe by Anderson and Van Heygen (2013). Captive females lay between six and nine eggs (Schuetze 1998).

The species is also present at Mt. Nlonako, very close to Mt. Manengouba. *T. pfefferi* has horns (males only), but its phylogenetic affinities are closer to the hornless species of the *T. wiedersheimi* group than to other Cameroon species (*T. montium* and *T. quadricornis*), indicating that the presence of horns has evolved several times within the genus *Trioceros*.

Its distribution is comparable to that of the *T. perreti* / *T. serratus* / *T. wiedersheimi* group and the *T. quadricornis* group (*T. q. quadricornis*, *T. q. gracilior*, and *T. q. eisentrauti*). These two groups of related taxa each have an endemic taxon in the Manengouba area, another in the BH and a third endemic in a peripheral region (to the north and west respectively). The populations of *T. pfefferi* recently discovered at Mbulu Hills and Ediango to the north (Gonwouo et al. 2006) should therefore be carefully compared with the more southern populations to assess their taxonomic status. Like other submontane and montane species from Cameroon, *T. pfefferi* occupies only medium and high mountain areas with wet, mainly pristine evergreen forests, often near streams (Jakubowicz and Van Tiggel 1998). It perches at heights between 1.6 m and 2.1 m (Herrmann et al. 2005), 7 m at Mt. Kupe, and 3.5 to 5.0 m at Manengouba (Anderson and Van Heygen 2013). The species is threatened on Mt. Manengouba by both logging and collecting for the pet trade.

Trioceros quadricornis gracilior Böhme and Klaver, 1981 (17 specimens)

Material: MNHN-RA 1998.0434-0435 (two specimens, Mt. Oku, above Oku village, elev. 2,200 m, coll. CamHerp L. Chirio, June 25, 1998) – MNHN-RA 2005.2715-2720 (six specimens, Mt. Oku, Elak Oku village, 6.202°N and 10.505°E, elev. 2,000 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.2722 (Oku Manchok, 6.241°N and 10.524°E, elev. 2,130 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.2723 (Mt. Oku, Lake Oku, 6.20°N and 10.45°E, elev. 2,250 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – MNHN-RA 2005.2724, 2005.2726-2727 (three specimens, Mt. Oku, Oku village, 6.202°N and 10.505°E, elev. 2,000 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – MNHN-RA 2005.2725 (Mt. Oku, Simonkuh village, 6.234°N and 10.572°E, elev. 2,109 m, coll. CamHerp M. LeBreton, July 8, 2002) – MNHN-RA 2007.1423 (male; Mt. Oku, Oku village, 6.202°N and 10.505°E, elev. 2,000 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 8, 2007) - MNHN-RA 2007.1424 (male; Mt. Oku, Oku village, 6.202°N and 10.505°E, elev. 2,000 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 8, 2007) - MNHN-RA 2007.1426 (male; Mt. Oku, Oku village, 6.202°N and 10.505°E, elev. 2,000 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 7, 2007).

Barej et al. (2010) revised the *T. quadricornis* complex with additional materials and molecular data. The morphological differences between the populations of the south (Mt. Kupe and Mt. Manengouba) and north (BH to Obudu Plateau in Nigeria) were supported by genetics, thus confirming the subspecific status of *T. q. quadricornis* (Tornier, 1899) and *T. q. gracilior* Böhme and Klaver, 1981. *T. q. gracilior* is present at Mts. Bamboutos, Mbulu Hills (Gonwouo et al. 2006), Mt. Lefo, Mt. Oku and onto the Obudu Plateau in Nigeria, while *T. q. quadricornis* occupies the forests of Mt. Manengouba and Mt. Kupe. This study also relegated *Chamaeleo eisentrauti*, once consid-

ered a valid species, to subspecific status as *T. q. eisentrauti* (Mertens, 1968). This form is endemic to Rumpi Hills in western Cameroon. All these taxa occupy primary mountain forests, and *T. q. gracilior* occurs up to 2,700 m in altitude. Tilbury (2010) reported the taxon between 1,600–2,500 m. The separation between these three subspecific taxa, attested by their low genetic divergence, is thus probably recent and associated with the altitudinal shifting of cool forests to the mountain peaks after the end of Pleistocene glacial periods.

Trioceros q. gracilior (Fig. 7) is an endemic subspecies of Cameroon and neighboring Nigeria (Plateau Obudu). This is an arboreal montane forest lizard (mostly met at the interface forest/grassland) that is still relatively abundant locally, such as around the village of Elak Oku (6.244°N, 10.508°E, elev. 1,970 m). Its altitudinal distribution reaches 2,400 m above sea level at Mt. Oku (Ijim Ridge; Wild 1994) and 2,700 m at Mt. Mekua in the Bamboutos (Gonwouo et al. 2006; Barej et al. 2010). Its perch height is much greater than that of *T. serratus* (see below) and averages around 1.9 m at Mt. Oku (Gonwouo et al. 2006). Wild (1994) found the chameleon from one m above the ground to the top of the canopy at Mt. Oku, with a preference for branches near streams. The minimum night temperature recorded in its habitat at 2,400 m is 4.7 °C in December 1993 (Wild 1994). The female lays from 6 to 24 eggs that are partially incubated before being laid (Abate 1994).

This species is particularly threatened by trade in exotic pets, and especially by rampant habitat destruction (deforestation, cultures, bush fires, grazing). Eucalyptus, an alien tree widely introduced in the region creates unfavorable habitat. However, the species seems able to persist in fragmented forest remnants and transitional habitats (Fig. 8). Its densities are estimated at four times higher at Mt. Oku compared to populations in Mbulu Hills (Gonwouo et al. 2006), and almost twice as high as at Mt. Manengouba (*T. q. quadricornis*). The conservation status of the species remains nevertheless very fragile and sensitive to environmental degradation. The threat of commercial harvesting is now better regulated by effective measures implemented mostly via European Union CITES regulation.

Trioceros serratus (Mertens, 1922) (101 specimens) (Figs. 9–14)

Material: MNHN-RA 1997.3642 (male; Mt. Oku, Oku village, coll. CamHerp L. Chirio, May 1997) – MNHN-RA 1998.0415 (female; Mt. Oku, Lake Oku, elev. 2,200 m, coll. CamHerp L. Chirio, July 6, 1998) – MNHN-RA 1998.0416-0430 (15 specimens, Mt. Oku, elev. 2,000-2,500 m, coll. CamHerp L. Chirio, June 25, 1998) – MNHN-RA 2005.2728-2732 (five specimens, Mt. Oku area, Anyajua village, above Bello, 6.236°N and 10.394°E, elev. 2,100 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – MNHN-RA 2005.2733-2734, 2005.2736 (three specimens, Awing village (Benjom), 5.867°N and 10.266°E, elev. 1,747 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.2735 (Awing village (Benjom), 5.867°N and 10.266°E, elev. 1,747 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002 – MNHN-RA 2005.2737 (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.2738-2744 (seven specimens, Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002 [MNHN-RA 2005.2739, .2741 and .2743: December 14, 2002]) – MNHN-RA 2005.2745 (Bamboutos, Mt. Mekua, 5.688°N and 10.095°E, elev. 2,700 m, coll. CamHerp L. Chirio, March 30, 2000) – MNHN-RA 2005.2748 (Bingo village, 6.166°N and 10.290°E, elev. 1,435 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.2749-2752 (four specimens, Mt. Oku, Elak Oku village, 6.202°N and 10.505°E, elev. 2,000 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.2755-2759 (five specimens, Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002 [MNHN-RA 2005.2758-2759: December 14, 2002]) – MNHN-RA 2005.2760-2761 (two specimens, Mbockghas, elev. 2,092 m, coll. CamHerp M.

Fig. 7. Despite its specific name, individuals of *T. q. gracilior* may have two to six horns. Adult male, Elak Oku village, Mt. Oku. Note the presence of concentric rings on the horns, a characteristic feature (synapomorphy) of the genus *Trioceros*. MNHN-RA 2007.1424. *Picture: I. Ineich, May 13, 2007.*

Fig. 8. Associated crops (beans, coffee, bananas, corn) encountered near villages (here around Elak Oku village) are not completely adverse to chameleons when a large plant and shrub cover is maintained. *Picture: I. Ineich, May 8, 2007.*

LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.2762-2771 (10 specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.2774-2775, MNHN-RA 2005.2777, MNHN-RA 2005.3381 (four specimens, Mufe village, 6.30°N and 10.35°E, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.2776, 2005.2778-2780 (four specimens, Njinkfuin, 6.187°N and 10.375°E, elev. 1,500 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) - MNHN-RA 2005.2781-2787, 2005.2900 (five males and three females; Mt. Oku, Simonkuh, 6.234°N and 10.572°E, elev. 2,109 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.2788 (male; Mt. Oku, Oku village, 10.505°E and 6.202°N, elev. 2,000 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – MNHN-RA 2005.2812-2815 (four specimens, Tefo village, 6.30°N and 10.37°E, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.2816-2824 (nine specimens, Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002 [MNHN-RA 2005.2817, .2819-2824: coll. July 8, 2002]) – MNHN-RA 2005.2900 (Mt. Oku, Simonkuh, 6.234°N and 10.572°E, elev. 2,109 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.3382 (Babadjou, 5.699°N and 10.187°E, elev. 1,580 m, coll. CamHerp L. Chirio, no date) – MNHN-RA 2005.3383 (Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) - MNHN-RA 2007.0461-0464 (two males and two females; Mt. Oku area, around Elak Oku village, 6.244°N and 10.507°E, elev. 1,973 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 6, 2007) – MNHN-RA[1] 2007.1461 (Mt. Oku, Oku village, elev. 2,000 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 7, 2007) – MNHN-RA 2007.1462 (Mt. Oku, Oku village, elev. 2,000 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 8, 2007) – MNHN-RA 2007.1463-1464, 2007.1472 (three specimens, Mt. Oku, Oku village, elev. 2,000 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 8, 2007) – MNHN-RA 2007.1465 (male; Mt. Oku area, Lake Oku, 6.202°N and 10.461°E, elev. 2,272 m, coll. I. Ineich and N. Lhermitte-Vallarino, May 8, 2007) – MNHN-RA 2007.1494 (male, neotype of *T. serratus*; Mt. Oku, on the side along the road from Anyajua to Belo, not far from Belo, coll. I. Ineich, May 9, 2007).

Fig. 9. *Trioceros serratus* male observed near a house in the village of Elak Oku at Mt. Oku. MNHN-RA 2007.1463. *Picture: I. Ineich, May 8, 2007.*

Fig. 10. The neotype of *Trioceros serratus*, MNHN-RA 2007.1494, photographed several days after his capture (see also other photographs below). *Picture: I. Ineich, May 13, 2007.*

Klaver and Böhme (1992) described the subspecies *T. wiedersheimi perreti* from Mt. Manengouba. Later molecular studies of Barej et al. (2010) highlighted the possible specific status of this taxon. This same study showed that the nominal subspecies *T. w. wiedersheimi* comprises two distinct genetic clades, separated geographically. Previously *T. w. wiedersheimi* was considered to occupy savanna and altitude grasslands from 1,400 to 2,450 m in Mts. Bamboutos, Mbulu Hills, Mt. Lefo, Mt. Mbam, Mt. Oku, and Mt. Tchabal Mbabo, and westwards into Nigeria at Mts. Gotel and Mambilla and the Obudu Plateaus. The original description of *T. wiedersheimi* was based on two syntypes, a female from Tchabal Mbabo and a subadult male from the BH. The female was designated as the lectotype of *T. w. wiedersheimi* by Klaver and Böhme (1992), thus restricting the type locality to Tchabal Mbabo. This restricted its distribution to the northern part of that previously accepted (Tchabal Mbabo and Tchabal Gangdaba). The southern populations (BH, Mt. Mbam and Mt. Oku) represent a distinct taxon that may also include the populations of the Koano, Mt. Lefo and Mbulu Hills, and Plateau of southern Nigeria, but this has to be verified. An available name, *Chamaeleo serratus* Mertens, 1922, was revalidated to accommodate these southern populations as *Trioceros serratus* (Mertens, 1922), although its name-bearing type was unfortunately destroyed during the Second World War. A neotype was designated by Barej et al. (2010) in recent MNHN collections (MNHN-RA 2007.1494, Figs. 10, 11). Its type locality is thus well attached to the area just above the city of Belo on the western flank of Mt. Oku.

Trioceros serratus occupies high savannas of the BH, Mt. Mbam and Obudu Plateau (Nigeria). Note, however, that the reports of Gotel Mountains in Nigeria should be attributed to *T. wiedersheimi*. In the BH region, the species is cited from Bafoussam (Bangwa), Big Babanki (= Kedjom Keku), the Bamileke region of Dschang, Kishong, Mezam (Bafout), and Tsch'a Bekom (Barej et al.

[1]Note that specimens MNHN-RA 2007.461-464 reported by Barej et al. (2010) refers to MNHN-RA 2007.1461-1464.

Fig. 11. Neotype of *T. serratus* (MNHN-RA 2007.1494) *in situ* before collection at the edge of the road down from the summit of Mt. Oku (Anyajua village), just a little over Belo (6.175°N and 10.352°E). The chameleon was perched nearly 3 m up in a palm tree. *Picture: I. Ineich, May 9, 2007.*

Fig. 12. *Trioceros serratus* widely used the herb layer where it was comfortable. Here an individual seeking to hide on a blade of grass by stiffening its tail to make it look like an herbaceous branching. Not collected. *Picture: I. Ineich, May 8, 2007.*

2010). Our study allows addition of the following locations in the BH: Awing (Benjom), Baba II, Bali Ngemba, Bingo, Mbiame, Mbockghas, Mboh, Mufe, Njinkfuin, Tefo, and Veko. It was reported from Bafut (elev. 1,200 m, 6.08°N and 10.10°E) by Joger (1982) as *Chamaeleo wiedersheimi*.

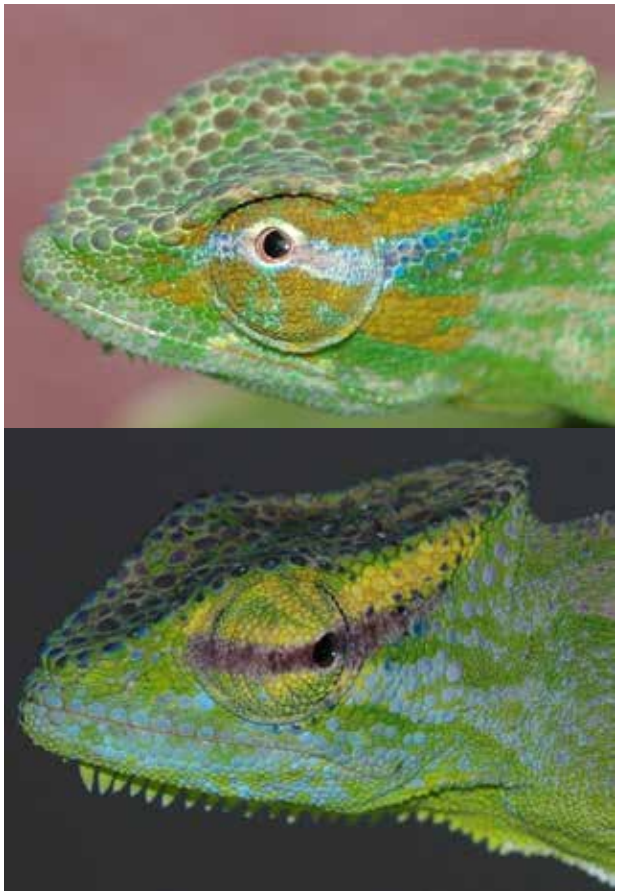

Fig. 13. Individuals assigned to *T. serratus* altitude populations (top, Elak Oku village; MNHN-RA 2007.1463) differ from those from lower altitudes like here (bottom) the neotype of *T. serratus* (MNHN-RA 2007.1494) by some important scalation and coloring characters. *Picture: I. Ineich, May 2007.*

Gonwouo et al. (2006) consider the taxon (named *T. w. wiedersheimi*) to occur from 1,500 m to 2,450 m altitude, often in sympatry with *T. quadricornis gracilior* on Bamboutos Mts. at Foto, Dschang, and Mts. Lefo, Mt. Oku, and Obudu Plateau in Nigeria, and 2,700 m in Mt. Mekua. Wild (1994) reported the species between 2,200 m and 2,500 m at Mt. Oku (Ijim Ridge). Tilbury (2010) cited the species from 2,600 m above sea level at Mt. Oku. Perch height average is 90 cm at Mt. Oku, the lowest value found for different stations of its range (over two m at Tchabal Mbabo). Wild (1994) reported a mean perch height of 53 cm at Mt. Oku and a maximum height of 157 cm. However, we collected the neotype of the species in a palm tree at three m height near the edge of a main road (Fig. 11)! The low perch height observed in altitude at Mt. Oku could be attributed to the scarcity of livestock and predators that cause little disruption for chameleons, or to a still unknown interaction between climate and vegetation (Fig. 12). The species tolerates some degree of habitat degradation and does not hesitate to venture into cultivated areas retaining some original vegetation. Yet it is a sensitive species, recently threatened by the exotic pet trade and especially the destruction of its habitat (culture, fires, deforestation). The population at Mt. Oku, however,

is still abundant. The species is common around the village of Elak Oku, including gardens and plantations. This is the most abundant Cameroon mountain chameleon. The species occupies relatively open habitats but does not hesitate to venture into closed canopy forest. A minimum night temperature of 2.9 °C was recorded in its habitat at 2,500 m altitude in December 1993 (Wild 1994). *Trioceros serratus* mostly occupies herbaceous and shrub layer below two m, while *T. q. gracilior* occupies bushy and shrub layers above one meter, which generates a syntopy area in the stratum located between one and two m (Wild 1994). Habitat separation in syntopy should be possible through the important size differences between both taxa, probably preventing dietary overlap.

The systematics of this species complex is not satisfactory, despite the revision of Barej et al. (2010). In fact, besides the obvious differences in size and coloration, the lowland form (larger) collected near Belo also differs from the altitude form (smaller) of the summit of Mt. Oku by the number of small scales around the large granules on the flanks (Figs. 13, 14). Also one of us (II) collected the neotype of *T. serratus* up in a palm tree and this form seems much more arboreal than the altitude Mt. Oku form. It is very unlikely that these two morphotypes belong to the same taxon and further studies are required.

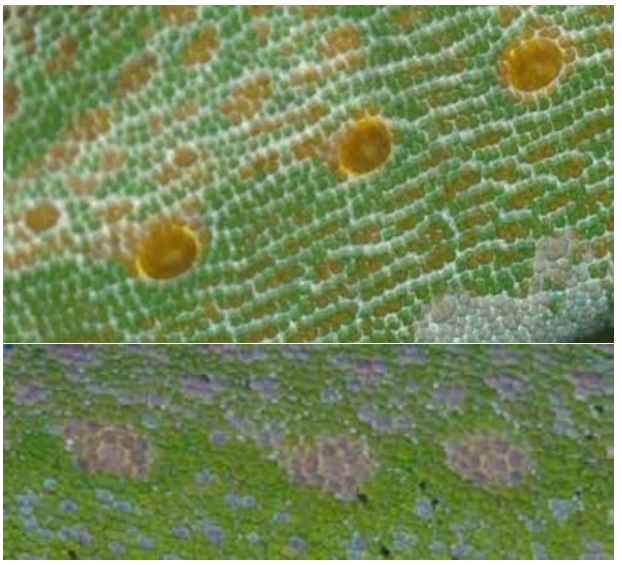

Fig. 14. Individuals assigned to altitude *T. serratus* populations (on top, Elak Oku village; MNHN-RA 2007.1463) are very different from those from lower altitudes like here (on botom) the neotype of *T. serratus* (MNHN- RA 2007.1494) by the conformation of the large granules arranged on the flanks and also by the number and arrangement of small scales placed around these large granules. *Pictures: I. Ineich, May 2007.*

Gekkonidae Gray, 1825

Hemidactylus angulatus Hallowell, 1852 (nine specimens)

Material: MNHN-RA 2005.1602-1603 (two specimens, Mt. Oku, Anyajua village above Bello, 6.236°N and 10.394°E, elev. 2,100 m, coll. CamHerp, respectively April 14, 2001, and April 19, 2001) – MNHN-RA 2005.1616 (Bingo village, between Ijim and Bamenda, 6.162°N and 10.319°E, elev. 1,600 m, coll. CamHerp, April 19, 2000) – MNHN-RA 2005.1692-1693 (two specimens, Bingo village, 6.166°N and 10.290°E, elev. 1,435 m, coll. CamHerp M. LeBreton, respectively December 14, 2002, and July 8, 2002) – MNHN-RA 2005.1761 (Idjim, Birdlife Project, 6.226°N and 10.433°E, elev. 1,600 m, coll. CamHerp L. Chirio, April 19, 2000) – MNHN-RA 2005.1927-1928 (two specimens, Njinkfuin, 6.187°N and 10.375°E, elev. 1,500 m, coll. CamHerp L. Chirio, April 19, 2000) – MNHN-RA 2005.2496 (Boyui village, 6.242°N and 10.311°E, elev. 1,400 m, coll. CamHerp L. Chirio, April 19, 2000).

This house gecko is probably one of the most anthropophilous species in the country, where it has a wide distribution throughout the northern region. The species is abundant in homes but does not hesitate to shelter also in rocks and trees in remote areas. It is found from sea level to above 2,000 m at Tabenken and Nkambe.

Hemidactylus kamdemtohami Bauer and Pauwels, 2002 (one specimen)

Material: MNHN-RA 2002.0739 (Balengou, elev. 1,480 m, 5.114°N and 10.450°E, coll. CamHerp, June 29, 2001).

Balengou remains the only known Cameroon location for this gecko, which elsewhere is known from Equatorial Guinea (Mt. Allen) and Gabon (Mt. Iboundji). *H. kamdemtohami* is without any doubt a submontane species. Its occurrence at lower elevations in Gabon may be because Mt. Iboundji, covered with evergreen forests, is wetter than the BH and thus the altitudinal limit of the species is reduced.

Scincidae Gray, 1825

Lacertaspis chriswildi (Böhme and Schmitz, 1996) (seven specimens)

Material: MNHN-RA 1997.3649 (Mt. Oku, in a garden of Oku village, elev. 2,000 m, coll. CamHerp L. Chirio, June 8, 1997) – MNHN-RA 1997.3650 (Mt. Oku, in the forest, elev. 2,350 m, coll. CamHerp L. Chirio, March 22, 1997) – MNHN-RA 1998.0286-0288 (three specimens, Mt. Oku forest, elev. 2,200 m, coll. CamHerp L. Chirio, June 25, 1998) – MNHN-RA 2005.2600-2601 (two specimens, Mt. Oku, Oku forest, 6.250°N and 10.507°E, elev. 2,350 m, coll. CamHerp M. LeBreton and L. Chirio, respectively May 5, 2000, and May 11, 2000).

This little lizard is endemic to the montane forests of West Cameroon (Schmitz 2004; Schmitz et al. 2005; Herrmann et al. 2006). It is found at Mt. Kupe in the Takamanda forest, Mt. Oku, and the Tchabal Mbabo Massif. It occurs up to 2,800 m altitude at Mt. Oku but does not seem to fall below 1,000 m.

Lacertaspis lepesmei (Angel, 1940) (35 specimens)

Material: MNHN-RA 1998.0295-0300, 1999.0401-0404, 1999.8418-8436 (29 specimens, without any precise location, coll. CamHerp) – MNHN-RA 2004.0061 (Bamboutos, Fulbe house, 5.637°N and 10.106°E, elev. 2,450 m, coll. CamHerp, May 5, 2001) – MNHN-RA 2005.2597-2599 (Bamboutos, Mt. Mekua, 5.688°N and 10.095°E, elev. 2,700 m, coll. CamHerp, respectively May 8, 2000, April 18, 2000, and April 19, 2000) – MNHN-RA 2005.2602-2603 (two specimens, without precise location, coll. CamHerp).

This small, submontane endemic skink is only known from the rocky slopes of Bamboutos Mountains, between 2,350 and 2,700 m altitude (Fig. 15). It is not present in the Mt. Oku region. Its classification in the IUCN Red List and the measures to undertake for the conservation of its habitat should be a priority.

Lepidothyris fernandi (Burton, 1836) [formerly *Mochlus fernandi*] (one specimen)

Material: MNHN-RA 2005.1265 (Tefo village, 6.30°N and 10.37°E, elev. 1,700 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002).

The genus was recently revised (Wagner et al. 2009). In Eastern Africa, the species occurs between 600 and 2,100 m (Spawls et al. 2002) whereas in Cameroon it is only reported from sea level to 1,200 m at Bafut. This skink was also observed on the eastern sides of the BH at Kenshi, at an elevation of 1,080 m on April 17, 2004 (6.107°N and 9.713°E).

Leptosiaphos ianthinoxantha (Böhme, 1975) (25 specimens)

Material: MNHN-RA 2002.0798, 2002.0800, 2002.0928-0930, 2002.0934 (six specimens, Mbockghas, 6.222°N and 10.582°E, elev. 2,092 m, coll. CamHerp M. LeBreton, December 14, 2002) – MNHN-RA 2002.0942, 2005.2617-2620 (five specimens, Mbockghas, 6.222°N and 10.582°E, elev. 2,092 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.2607 (Bamboutos, Fulbe house, 5.637°N and 10.106°E, elev. 2,450 m, coll. CamHerp, May 5, 2001) – MNHN-RA 2005.2613-2616 (four specimens, Bamboutos, Mt. Mekua, 5.688°N and 10.095°E, elev. 2,700 m, coll. CamHerp, March 30, 2000, May 5, 2000 [.2615], and May 8, 2000 [.2616]) – MNHN-RA 2005.2621-2627, 2005.2629 (eight specimens, Mt. Oku, Simonkuh, 6.234°N and 10.572°E, elev. 2,109 m, coll. CamHerp M. LeBreton, July 8, 2002, December 14, 2002 [.2625], and January 16, 2003 [.2622, .2626]) – MNHN-RA 2005.2628 (Bamboutos, slopes of Mt. Mekua, 5.698°N and 10.101°E, elev. 2,300 m, coll. CamHerp, March 19, 2002).

Fig. 15. *Lacertaspis lepesmei*. MNHN-RA 2004.0061 (see above). *Picture: M. LeBreton.*

Fig. 16. *Leptosiaphos ianthinoxantha.* Cameroon, Mt. Oku, Oku Simonkou village. *Picture: M. LeBreton, November 2002.*

This small skink is endemic to montane grasslands of the Western Highlands of Cameroon (Schmitz et al. 2005) (Fig. 16). It is found at Mt. Lefo (Forest Reserve of Bafut-Ngemba) and in the Bamboutos Mountains. Its occurrence at Mt. Oku had been suspected by Wild in 1994. It is a semi-burrowing species living in open montane grasslands, and is oviparous. The species occurs up to 2,700 m altitude at Mt. Mekua in the Bamboutos where its populations are highly localized but occur in high densities.

Leptosiaphos pauliani (Angel, 1940) (one specimen)

Material: MNHN-RA 1939.0082 (holotype; Bamboutos, coll. J.-L. Perret).

This small endemic lizard was recorded by Perret (1973) from Nyassosso on the slopes of Mt. Kupe at 1,100 m above sea level (holotype of *Riopa erythropleuron* Mertens, 1968) and from Mts. Bamboutos at 2,300 m above sea level (holotype of *Lygosoma* (*Liolepisma*) *pauliani* Angel, 1940). It was not found during the CamHerp project work; its presence in the BH is questionable. This strictly submontane species may be limited to the area of submontane forests located between 1,100 and 2,000 m above sea level in the Mts. Kupe and Bamboutos.

Leptosiaphos vigintiserierum (Sjöstedt, 1897) (two specimens)

Material: MNHN-RA 1998.0294 (Mt. Oku, elev. 2,000 m, coll. CamHerp L. Chirio, September 1st, 1997) – MNHN-RA 2004.0062 (Bamboutos, waterfall and sacred forest, 5.622°N and 10.106°E, elev. 2,350 m, coll. CamHerp, May 5, 2001) – Bamboutos, slopes of Mt. Mekua, 5.698°N and 10.101°E, elev. 2,300 m, coll. CamHerp, March 19, 2002).

This species is endemic to the Cameroon Volcanic Dorsal (Schmitz et al. 2005) (Fig. 17). It is found from Bioko Island (Equatorial Guinea), Mt. Cameroon, and Mt. Oku (Mt. Nkolodou, Mt. Kala, Mt. Kupe, and Mt. Nlonako). It mainly occurs in the high meadows of the peaks above the evergreen forest areas. It reaches 2,450 m at Mts. Bamboutos and can be relatively abundant locally.

Fig. 17. *Leptosiaphos vigintiserierum.* Cameroon, Mt. Mekua, Bamboutos. Specimen CamHerp 3643I. *Picture: M. LeBreton, March 12, 2002.*

Trachylepis maculilabris (Gray, 1845) (33 specimens)

Material: MNHN-RA 1997.3643 (pass on the Bafoussam road, elev. 1,850 m, coll. CamHerp L. Chirio, April 1997) – MNHN-RA 1998.0289-0293 (five specimens, Mt. Oku, five km north of Oku village, elev. 2,000 m, coll. CamHerp L. Chirio, June 25, 1998) – MNHN-RA 2005.1610-1611 (two specimens, Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton and L. Chirio, respectively July 8, 2002, and December 14, 2002) – MNHN-RA 2005.1616 (Bingo village, between Ijim and Bamenda, 6.162°N and 10.319°E, elev. 1,600 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – MNHN-RA 2005.1617 (Bali Ngemba village, 5.833°N and 10.077°E, elev. 1,398 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.1623 (Bamboutos, waterfall and sacred forest, 5.622°N and 10.106°E, elev. 2,350 m, coll. CamHerp, May 5, 2001) – MNHN-RA 2005.1692-1693 (Bingo village, 6.166°N and 10.290°E, elev. 1,435 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.1761 (Idjim village, Birdlife Project, 6.226°N and 10.433°E, elev. 1,600 m, coll. CamHerp M. LeBreton and L. Chirio, April 19, 2000) – MNHN-RA 2005.1762 (Jakiri village, road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.1847-1848 (two specimens, Mbiame village, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.1852 (Mbockghas, 6.222°N and 10.582°E, elev. 2,092 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.1853-1858 (six specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002 [.1853], and July 8, 2002 [.1854-1858]) – MNHN-RA 2005.1897 (Mufe village, 6.30°N and 10.35°E, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – MNHN-RA 2005.1935-1938 (four specimens, Mt. Oku, Simonkuh village, 6.234°N and 10.572°E, elev. 2,109 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002, and December 14, 2002 [.1938]) – MNHN-RA 2005.1944 (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton and L. Chirio, December 14, 2002) – MNHN-RA 2005.1958-1959 (two specimens, Sarkong Hill, west of Jakiri, 6.054°N and 10.598°E, elev. 1,600 m, coll. CamHerp, March 19, 2002) – MNHN-RA 2005.2484 (Tefo village, 6.30°N and 10.37°E, elev. 1,700 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002).

This skink has a wide distribution in Africa and in Cameroon it is found in a variety of habitats from lowland forests to altitude grasslands. The species is also anthropophilic and can be abundant in gardens and villages in the southern half of the country. This lizard occurs from sea level to above 2,550 m at Mt. Lefo or on the top of Mt. Nlonako around 1,825 m (Herrmann et al. 2005). In East Africa *T. maculilabris* is reported from the seaside to above 2,300 m (Spawls et al. 2002; Largen and Spawls 2010). Note, however, that its taxonomy is not clearly established (Mausfeld et al. 2004) and that it currently represents a species complex containing several cryptic taxa.

Trachylepis mekuana (Chirio and Ineich, 2000) (six specimens)

Material: MNHN-RA 2001.0109 (Bamboutos, Mt. Mekua, 5.688°N and 10.095°E, elev. 2,700 m, coll. CamHerp, April 19, 2000) – MNHN-RA 2002.0922 (Bali Ngemba village, on rocks above the valley, 5.830°N and 10.066°E, elev. 1,640 m, coll. CamHerp M. LeBreton, July 8, 2002) – MNHN-RA 2005.1289-1291 (three specimens, Bamboutos, slopes of Mt. Mekua, 5.698°N and 10.086°E, elev. 2,600 m, coll. CamHerp, March 19, 2002) – MNHN-RA 2005.2606 (Bamboutos, 5.637°N and 10.106°E, elev. 2,450 m, coll. CamHerp L. Chirio, March 30, 2000).

This endemic mountain lizard of the BH in Cameroon occupies only the top of Bamboutos Mountains (Mt. Mekua) and the Massif of Bali-Ngemba at elevations located between 2,400 and 2,700 m (Fig. 18). The increasing use of its habitat for grazing and planting food crops seriously threatens the survival of this species. Its classification on

Fig. 18. *Trachylepis mekuana.* Mt. Mekua, Bamboutos. March 18, 2002. *Picture: L. Chirio.*

Fig. 19. *Atractaspis i. irregularis* – Cameroon, Yaounde. *Picture: M. LeBreton, January 4, 2011.*

the IUCN Red List and habitat conservation measures should be a priority.

SNAKES

Atractaspididae Günther, 1858

Atractaspis irregularis irregularis (Reinhardt, 1843) (six specimens)

Material: CamHerp 0627C, 0423C (two specimens, Abu village, NE of Fundong, 6.297°N and 10.331°E, elev. 1,750 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 3501I (Awing village (Benjom), 5.867°N and 10.266°E, elev. 1,747 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 1269C, 1495I (two specimens, Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 0158C (Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp, December 14, 2002).

This burrowing and venomous snake (Barrière et al. 2006) exhibits an extensive African distribution (Fig. 19). It occupies dense evergreen forests and degraded semi-deciduous forests, forest-savanna mosaics (moist savanna), the Western Highlands, and the extreme south of the Adamaoua. It is found in altitude from 500 m to 2,000 m at Tabenken. This snake was mentioned in Wum (elev. 1,023 m) by Böhme (1975). In East Africa, the species is reported from 600 m to 2,000 m above sea level (Spawls et al. 2002; Largen and Spawls 2010).

Polemon collaris (W. Peters, 1881) (four specimens)

Material: CamHerp 3468I, 3707I (two specimens, Bingo village, 6.166°N and 10.290°E, elev. 1,435 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 3738I (Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 3664I (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002).

This small forest burrowing snake is found at altitudes between 5 and 1,955 m in Cameroon. Joger (1982) mentions the species from Wum (elev. 1,023 m).

Colubridae Oppel, 1811

Crotaphopeltis hotamboeia (Laurenti, 1768) (four specimens)

Material: CamHerp 0141, 2488I (two specimens, Jakiri village on the road of Nkambe to Bamenda, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, July 8, 2002, and December 14, 2002) – CamHerp 2483I (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 0159C (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002).

This widely distributed snake occurs at elevations from 400–2,500 m in East Africa (Largen and Spawls 2010). In Cameroon, it is found at altitudes between 160 and 2,044 m. Mountain populations in Cameroon show a particular coloration, with a typical dark spotted belly; they could belong to a distinct taxon (see below). The relationship of individuals from Veko and Baba II villages to the submontane species listed below should be reviewed.

Crotaphopeltis sp. (three specimens)

Material: CamHerp 4469, 4470 (two specimens, Mt. Oku, Bello village, 6.170°N and 10.344°E, elev. 1,450 m, coll. CamHerp, April 19, 2000) – CamHerp 0349I (City of Bamenda, 5.958°N and 10.165°E, elev. 1,300 m, coll. CamHerp, March 20, 2001).

This "species" has not been described yet but its validity, which remains to be confirmed, was indicated by Chirio and LeBreton (2007: 400–401). It is considered endemic to the mountains of Cameroon and occurs between 1,050 m and 1,500 m.

Dasypeltis confusa Trape and Mané, 2006 (three specimens)

Material: CamHerp 2436I (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 0097 (Awing village (Benjom), 5.867°N and 10.266°E, elev. 1,747 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 1367C (Bali Ngemba village, 5.833°N and 10.077°E, elev. 1,398 m, coll. CamHerp M. LeBreton, July 8, 2002).

This snake is a typical inhabitant of the humid savanna of Cameroon where it occurs at altitudes between 510 m and 2,044 m.

Dasypeltis fasciata A. Smith, 1849 (three specimens)

Material: CamHerp 0218C (Jakiri village on the road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 2272I (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 2436I (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002).

This semi-arboreal snake is found at altitudes between 4 and 1,380 m. It is reported from Bafut (elev. 1,200 m, 6.08°N and 10.10°E) by Joger (1982).

Dipsadoboa unicolor Günther, 1858 (two specimens)

Material: MNHN-RA 1998.0438-0439 (two specimens, Mt. Oku, Oku village, elev. 2,000 m, coll. CamHerp L. Chirio, end 1997).

This nocturnal and semi-arboreal snake has a wide African distribution from Guinea (Conakry) to Burundi. In Cameroon, it occupies not only the altitude forest of the west of the country but also evergreen degraded forests. It occurs from around sea level up to 2,000 m at Mt. Oku and up to 2,044 m in Veko, a village in the southeast of Mt. Oku. At Mt. Nlonako, the species does not reach the higher elevations of the massif (Herrmann et al. 2005).

This snake is still present over 1,600 m at Mt. Nimba (Ineich 2003), but can occur elsewhere up to 3,000 m and also can withstand low temperatures while remaining active at night and hunting amphibians on which it feeds. In East Africa, it is only reported between 1,500 m and 3,000 m elevation. The conspecificity of West African populations (Mt. Nimba, Cameroon Volcanic Dorsal) with those of the East African mountains has not been confirmed.

Dipsadoboa weileri (Lindholm, 1905) (seven specimens)

Material: CamHerp 0835, 0101M, 0043C (three specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp M. LeBreton, July 8, 2002 (two specimens), and December 14, 2002 (one specimen)) – CamHerp 0606C (Fundong, 6.249°N and 10.315°E, elev. 1,500 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 0248C (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 1437C (Mbiame village, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 119 (Awing village (Benjom), 5.867°N and 10.266°E, elev. 1,747 m, coll. CamHerp M. LeBreton, December 14, 2002).

This nocturnal forest semi-arboreal snake occurs in Cameroon at altitudes from 10 m to above 2,000 m. The species is more likely a central African species which was erroneously reported from West Africa (Trape and Baldé 2014).

Dispholidus typus (A. Smith, 1828) (one specimen)

Material: CamHerp 3197I (Baba II village, elev. 1,772 m, 5.857°N and 10.102°E, coll. CamHerp M. LeBreton, December 14, 2002).

This diurnal semi-arboreal snake has a wide pan-African distribution in the savannas. The subspecies *Dispholidus typus occidentalis* Perret, 1961 described from Cameroon remains doubtful but requires a thorough revision before its validity can be evaluated (Broadley and Wallach 2002). Perret (1961: 138) recognized *D. t. occidentalis* based on its color with green males, strongly streaked with black, red and brown females, as well as the presence of two elliptical black spots, slightly oblique, situated laterally on each side of the neck in both sexes. The species occupies forest-savanna mosaic, the western Highlands and the high savannas. Its altitude record on its whole range is 2,400 m (Spawls et al. 2002; Wagner and Böhme 2007; Largen and Spawls 2010).

Grayia tholloni Mocquard, 1897 (one specimen)

Material: CamHerp 2050C (Jakiri village, on the road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, July 8, 2002).

This water snake is found up to 1,400 m above sea level in East Africa (Largen and Spawls 2010) and between 510 and 1,550 m in Cameroon.

Philothamnus angolensis Bocage, 1882 (two specimens)

Material: MNHN-RA 1998.0410 (Mt. Oku, above the village, elev. 2,200 m – tail broken – formerly identified as *Philothamnus bequaerti*, coll. CamHerp L. Chirio, June 25, 1998) – CamHerp 3749I (Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002).

This arboreal snake of wet savanna occupies degraded forests, forest-savanna mosaics, the western Highlands, and altitude savannas like the Sudan savanna in the plains. Herrmann et al. (2006) reported the species up to 2,450 m at Mt. Meletan in the Bamboutos, as well as at Tchabal Mbabo Range. A snake reported from the area as *Philo-*

thamnus irregularis by Joger (1982) refers to this species (Hughes 1985: 518; Böhme and Schneider 1987). In East Africa, it occupies various habitats from the sea border up to 2,000 m elevation (Spawls et al. 2002). This species from Central and Eastern Africa only extends very little west beyond the Cameroon border.

The Mt. Oku specimen deposited in the collections (MNHN-RA 1998.0410) is a female formerly identified as *Philothamnus bequaerti* but here conservatively considered to correspond to *P. angolensis*. It measures 565 mm SVL and stubby tail measurement is 201+ mm. There are 15 dorsal scale rows in the middle of the body, 1+164 unkeeled ventral plates, and 79+ subcaudals, also unkeeled. Anal plate is divided. The supralabials (right/left) are 9 (4–6 touching the eye)/9 (4–6), infralabials 9/9, temporals 1 + 1/1 + 1, preoculars 1/1 and postoculars 2/2. The inside of the mouth is white. Its assignment to *P. angolensis* is not entirely compatible with the species' description, however.

Philothamnus hughesi Trape and Roux-Estève, 1990 (one specimen)

Material: CamHerp 880 (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, December 14, 2002).

This tree snake of wet savannas occurs at an altitudinal range between 740 and 2,100 m.

Thrasops flavigularis (Hallowell, 1852) (one specimen)

Material: MNHN-RA 1998.0436 (skin, head and neck only; Mt. Oku, Oku village, elev. 2,050 m, coll. CamHerp L. Chirio, November 8, 1997).

This snake is a typical inhabitant of the dense forests of Central Africa, from Cameroon to the Democratic Republic of Congo. It is common to find in the villages and plantations. *Thrasops flavigularis* occupies the Highlands up to 2,000 m at Mt. Oku. Gonwouo et al. (2007) recognize it as an inhabitant of submontane forests in Cameroon. This snake, once considered non-venomous, is capable of inflicting serious envenomations (Ineich et al. 2006) and should be handled with caution.

Our specimen, MNHN-RA 1998.0436, only consists of the head, neck [in good condition], and the skin of an individual eaten by the local population. It has 15 dorsal scale rows in the middle of the body, which seems rare according to Chippaux (2006), because there are more often only 13 – however 15 dorsal scales seems more typical of grass field populations (Stucki-Stirn 1979). Preoculars are 2/2 and the upper is the largest (>2 times the size of the lower). The upper preoculars are widely separated from the frontal. The first post-ocular prevents contact of the supralabial 6 with the eye. Postoculars 3/3 and the lower is much larger and elongated (>4 times) than the other two substantially equal in size. The lower postocular contacts two supralabials (5–6). There are only 7(4–5)/7(4–5) supralabials and 10/11 infralabials. Temporals 1+1/1+1. This specimen slightly differs from the diagnosis given by Chippaux (2006: 108–109) and Stucki-Stirn (1979: 320–328) for the species.

According to Chippaux (2006), our specimen differs from *Thrasops jacksoni* because it has 2 preoculars (versus 3), its much larger lower postocular (vs. sup. and inf. larger) and 7 supralabials (vs. 10–12) and from *Thrasops occidentalis* because the large postocular is in contact with 2 supralabials (vs. postocular in contact with 3 supralabials). We refer that damaged specimen to *Thrasops flavigularis* and consider some of the characters indicated in the diagnosis of the species given by Chippaux (2006) as incomplete.

Elapidae Boie, 1827

Dendroaspis jamesoni jamesoni (Traill, 1843) (eight specimens)

Material: MNHN-RA 2000.4360, 2000.4376, 2002.0385-0389 (seven specimens, Bamenda, gift Latoxan, coll. October 30, 2000) – CamHerp 3428I (Jakiri village on the road from Nkambe to Bamenda, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, December 14, 2002).

This venomous tree snake has a wide distribution range extending from Togo in West Africa to Angola in southern Africa. It occupies dense evergreen and semi-deciduous forests, forest-savanna mosaics, the Western Highlands, and high savannas of Adamaoua (681 m at Tchabal Mbabo; Herrmann et al. 2006). It often frequents plantations and gardens but is unaggressive. It occurs in altitude up to 2,000 m at Mts. Bana. Gonwouo et al. (2007) considered the species as an inhabitant of mountain forests located above 1,800 m. It seems to live up to 2,200 m elsewhere on its range. In East Africa this green mamba is reported from 600 m to 2,200 m above sea level (Spawls et al. 2002).

Naja melanoleuca Hallowell, 1857 (22 specimens)

Material: CamHerp 1488I, 3184I (two specimens, Abu village, northeast of Fundong, 6.297°N and 10.331°E, elev. 1,750 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 1222C, 3175C, 3736C (three specimens, Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 3140I, 3394I (two specimens, Bali Ngemba village, 5.833°N and 10.077°E, elev. 1,398 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 0880C, 3295I (two specimens, Bingo village, 6.166°N and 10.290°E, elev. 1,435 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 4496 (Fundong, 6.249°N and 10.315°E, elev. 1,500 m, coll. CamHerp L. Chirio, April 19, 2000) – CamHerp 3134I (Jakiri village along the road from Bamenda to Nkambe, 6.055°N

and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 1234I, 0557C (two specimens, Mbiame village, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 0856, 0014C, 0133C (three specimens, Mbockghas village, 6.222°N and 10.582°E, elev. 2,092 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 0392C, 1086C, 2356I, 3392I (four specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp, July 8, 2002) – CamHerp 3291I (Sarkong Hill, west of Jakiri village, 6.054°N and 10.598°E, elev. 1,600 m, coll. CamHerp, March 19, 2002) – CamHerp 1452C (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, July 8, 2002).

This species (Fig. 20) has a wide distribution and the systematics of the species complex remains problematic. The name *N. melanoleuca* has only to be applied to central African populations. It occupies dense evergreen and semi-deciduous forests, forest-savanna mosaics, and the Western Highlands. It is found from sea level up to 2,700 m at Mt. Meletan in the Bamboutos. Gonwouo et al. (2007) consider that this snake can occur in mountain forests between 1,800 m and 3,000 m above sea level in Cameroon. The cobra is quoted from Bafut (elev. 1,200 m, 6.08°N, 10.10°E) by Joger (1982). The species, as currently recognized (sensu lato), is reported up to 2,500 m altitude in Kenya (Spawls et al. 2002; Wagner and Böhme 2007; Largen and Spawls 2010).

Naja nigricollis Reinhardt, 1843 (one specimen)

Material: CamHerp 1500C (Jakiri village along the road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, July 8, 2002).
This spitting cobra species seems not to exceed 1,000 m elevation in East Africa where another related species, *Naja ashei* Wüster and Broadley, 2007, can occur above 1,750 m (Largen and Spawls 2010). *Naja nigricollis* is found between 20 and 1,800 m elevation in Cameroon.

Lamprophiidae Fitzinger, 1843

The validity of this family was recently demonstrated by Kelly et al. (2011). This work showed that the genus *Lamprophis* was polyphyletic. A new genus was created and other species previously included in the genus *Lamprophis* were divided into three groups: (1) *virgatus* and *fuliginosus*, together with *lineatus* and *olivaceus* were transferred to the revalidated genus *Boaedon* A.M.C. Duméril, Bibron, and A.H.A. Duméril, 1854; (2) *Lycodonomorphus* was nestled within *Lamprophis* sensu lato and a sister taxon of *Lamprophis inornatus*–the latter species was therefore transferred to the genus *Lycodonomorphus*; (3) *Lamprophis* sensu stricto was restricted to a small clade of four species endemic to South Africa, with *Lamprophis aurora* as type species. We follow this revised taxonomy here.

Fig. 20. *Naja melanoleuca.* Cameroon, Bamessing, October 31, 2003. *Picture: M. LeBreton.*

Boaedon fuliginosus (Boie, 1827) [formerly *Lamprophis fuliginosus*] (two specimens)

Material: CamHerp 0992C (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 1365C (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, December 14, 2002).

Boaedon fuliginosus is a snake often encountered in and around houses. Nocturnal and terrestrial, it has a very wide African distribution, although populations in southern and eastern Africa were referred to *B. capensis* (Hughes 1997). It occupies a variety of habitats ranging from dense evergreen and semi-deciduous degraded forests, to forest-savanna mosaics through the Adamaoua high savannas and Sudanian savannas. It occurs up to 2,044 m at Veko village in the BH and up to 2,400 m in East Africa (Spawls et al. 2002; Largen and Spawls 2010).

Boaedon virgatus (Hallowell, 1854) (one specimen)

Material: CamHerp 3747I (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002).

This terrestrial forest species is present between 10 m and 1,770 m elevation in Cameroon.

Bothrolycus ater Günther, 1874 (five specimens)

Material: CamHerp 0487C, 3403I, 0174, 0306 (four specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp M. LeBreton, July 8, 2002 (two specimens) and December 14, 2002 (two specimens) – CamHerp 3238I (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002).

This terrestrial forest snake is present at elevations between 10 m and 1,500 m in Cameroon.

Gonionotophis stenophthalmus (Mocquard, 1887) (one specimen)

Material: CamHerp 0897 (Jakiri village along the road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, July 8, 2002).

This semi-arboreal, ophiophagous forest snake is present between 50 m and 1,500 m elevation in Cameroon.

Lycophidion multimaculatum Boettger, 1888 (two specimens)

Material: MNHN-RA 2002.0943 (Awing village (Benjom), 5°3'28''N and 10°1'4''E, elev. 1,747 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp – (Bamboutos, Fulbe house, elev. 2,450 m, coll. CamHerp P. Makolowodé, June 12, 1999).

The specimen MNHN-RA 2002.0943 is identified as *Lycophidion multimaculatum*. It measures 250 mm SVL and its tail is 28 mm. It has 17 dorsal rows at midbody. Its non-keeled ventrals are 2+186 and unkeeled subcaudals 30. Anal plate is entire. Supralabials (right/left) 8 (3–5 in contact with the eye)/8 (3–5), infralabials 8/8 (1–4 in contact with the first pair of gular), temporals 1+2+3/1+2+3, preocular 1/1, postoculars 2/2. An apical pit distinguished on dorsal scales and anterior gulars are of the same size as the posterior. That specimen is uniform grey bluish dorsally and ventrally, only slightly lighter ventrally; no marks, rings, or spots can be seen. Its diagnosis is not entirely consistent with that of the species to which we refer to tentatively. The species is found between 510 m and 2,450 m elevation (Mt. Meletan, Bamboutos) in Cameroon. So it is a partially submontane species in Cameroon (i.e., but not strictly submontane, much like *Dipsadoboa unicolor*).

Psammophiidae Boie, 1827

Psammophis cf. *phillipsii* (Hallowell, 1844) (three specimens)

Material: CamHerp 180, 601C, 844C (three specimens, Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002).

This terrestrial snake is common in Cameroon and Central African Republic. It occupies a variety of habitats ranging from degraded forests to high savannas. It does not hesitate to frequent the villages and even large cities like Yaounde. The species is abundant in the whole southern half of the country, except in undisturbed forest areas, and is found up to 2,000 m at Tabenken. Species status was granted to this taxon by Kelly et al. (2008) as *Psammophis occidentalis* Werner, 1919, but that name does not apply to those populations of the *P. phillipsii* complex (entire anal plate). They are however distinct from *P. phillipsii* sensu stricto and their status is under revision (Trape, pers. comm. to LC). Those populations were previously recognized as *P. phillipsii* by Chirio and Ineich (2006) and Chirio and LeBreton (2007). They belong to a central African species whose distribution does not occur west of the Cameroon border. This snake (as *Psammophis sibilans*) was also reported from Bafut (elev. 1,200 m, 6.08°N, 10.10°E) by Böhme (1975).

Psammophis sp. 1 (in: Chirio and LeBreton 2007: 540–541) (one specimen)

Material: CamHerp 0645C (Oku Simokuh village, 6.234°N and 10.572°E, elev. 2,109 m, coll. CamHerp, July 8, 2002).

This undescribed terrestrial species is an inhabitant of the Cameroon mountains, and seems to share external morphological affinities with an Ethiopian specimen from MNHN-RA collections. It occupies the Western Highlands, but also the Adamaoua high savannas. Currently its distribution is limited to a few peaks of the Cameroon Volcanic Dorsal, where it ascends to 2,109 m altitude at Mt. Oku.

Typhlopidae Jan, 1863

Afrotyphlops cf. *punctatus* (Leach, 1819) (11 specimens; see below)

Material: CamHerp 0087C, 3237I (two specimens, Tefo village, 6.30°N and 10.37°E, coll. CamHerp M. LeBreton, and L. Chirio, July 8, 2002) – CamHerp 1412I (Mufe village, 6.30°N and 10.35°E, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002) – CamHerp 1018C 1208C (two specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp L. Chirio, July 8, 2002); CamHerp 1253C, 3135I, (two specimens, Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp L. Chirio, December 14, 2002); CamHerp 0176C, 1021C (two specimens, Abuh village, NE of Fundong, 6.297°N and 10.331°E, elev. 1,750 m, coll. CamHerp M. LeBreton, December 14, 2002) – CamHerp 0396C, 0180M (two specimens, Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, December 14, 2002).

Specimens are only provisionally attributed to this species pending further study and occur in marbled and unmarbled forms. This burrowing snake is found at altitudes between 5 m and 1,800 m in Cameroon from Mboh village (1,800 m), Baba II village (1,770 m) and Idjim village (1,600 m)). *Afrotyphlops* cf. *punctatus* is found between 10 m and 1,800 m above sea level in Cameroon, and has been reported from Wum (elev. 1,023 m, 6.39°N and 10.07°E) by Böhme (1975).

Viperidae Oppel, 1811

Atheris broadleyi Lawson, 1999 (one specimen)

Material: CamHerp 0974C (Bali Ngemba village, 5.833°N and 10.077°E, elev. 1,398 m, coll. CamHerp M. LeBreton, July 8, 2002).

This small arboreal forest viper (Fig. 21) is found at altitudes between 332 m and 1,398 m in Cameroon (Chirio and LeBreton 2007). The species is also present in the Central African Republic. The geographic distribution of this small tree viper is still unclear (Phelps 2010), but it occurs with certainty in Cameroon and the Central African Republic (Chirio and Ineich 2006).

Atheris squamigera (Hallowell, 1854) (two specimens)

Material: CamHerp 0336, 1205C (two specimens, Forest Reserve of Bali Ngemba, 5.825°N and 10.087°E, elev. 1,400 m, coll. CamHerp, March 19, 2002).

This semi-arboreal viper is an inhabitant of the dense forests that occur from sea level up to 1,900 m (Broadley 1998). This is exceeded by *Atheris nitschei*, an East African species that occurs up to 2,700 m (Phelps 2010).

Bitis arietans arietans (Merrem, 1820) (two specimens)

Material: CamHerp 0694C (Veko village, 6.139°N and 10.578°E, elev. 2,044 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 3523I (Jakiri village along the road from Bamenda to Nkambe, 6.055°N and 10.658°E, elev. 1,550 m, coll. CamHerp M. LeBreton, December 14, 2002).

This big and massive snake has a pan-African distribution, and is also found on the Arabian Peninsula. It frequents forest-savanna mosaics, the Western Highlands, and all types of savannas (high, Sudanese, and Sahelian). It lives at ground level and bites are frequent, making it a feared snake. It occupies elevation areas up to 2,044 m in the village of Veko in the BH. Its wide distribution in Africa was largely influenced by the occupation of climatic refuges during periods of glaciation (Barlow et al. 2013). Other altitude populations exist such as those of the East African Mountain Arc or of the Drakensberg mountains in South Africa (Phelps 2010; Barlow et al. 2013). The altitudinal record for the species is around 2,200 m but the species seems able to occur even higher, up to 2,400 m (Spawls et al. 2002; Largen and Spawls 2010).

Bitis gabonica (A.M.C. Duméril, Bibron and A.H.A. Duméril, 1854) (one observed specimen)

Material: One specimen was observed but not collected near Bangangte at 1,480 m elevation.

This big forest viper was reported from Bafut (elev. 1,200 m, 6.08°N and 10.10°E) by Stucky-Stirn (1979) and found at 1,500 m in the western extension of the BH, and also at Mende in the Takamanda. It was observed by one of us (LC) at almost 1,500 m near Bangangte. In Cameroon it is found at altitudes between 5 m and only 1,500 m, but occurs over 2,300 m in East Africa (Kucharzewski 2011).

Fig. 21. *Atheris broadleyi.* Megangme, 4.598°N and 12.225°E, elev. 610 m, September 8, 2012. *Picture: M. LeBreton.*

Bitis nasicornis (Shaw, 1802) (no available specimen)

This bulky viper, characterized by its horn-shaped scales at the snout tip, shows a vast African distribution. It occupies dense evergreen and semi-deciduous forests, the Western Highlands, and the forest-savanna mosaics in well-preserved forest pockets. It prefers moist valley bottoms in the dense forests, and is considered a dangerous venomous snake. It occurs up to 2,000 m altitude at Lake Awing in the BH in Cameroon (specimen observed but not collected), and up to 2,400 m in East Africa (Spawls et al. 2002; Kucharzewski 2011). It was reported from Mbengwi, northwest of Bamenda (elev. 1,200 m) by Stucky-Stirn (1979).

Causus maculatus (Hallowell, 1842) (three specimens)

Material: CamHerp 1350C (Baba II village, 5.857°N and 10.102°E, elev. 1,772 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 0147C (Bali Ngemba village, 5.833°N and 10.077°E, elev. 1,398 m, coll. CamHerp M. LeBreton, July 8, 2002) – CamHerp 0818I (Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002).

This small nocturnal viper is very common in wet savanna and degraded forests areas. It does not hesitate to venture into the villages at night but its venom is only slightly harmful. Its distribution is broad and includes much of the African continent, from Mauritania to Uganda and Angola. It can be present up to 1,950 m altitude at Mbiame in the BH in Cameroon, which seems to be its altitude record all over its range (Kucharzewski 2011). Its presence in East Africa seems questionable and should probably refer to an undescribed high-elevation species close to the endemic species reported below. In Ethiopia it is only known from a few specimens collected between

500 and 1,000 m above sea level (Largen and Spawls 2010).

Causus sp. (in: Chirio and LeBreton 2007: 612–613) (four specimens)

Material: CamHerp 0964C (Mboh village, 6.327°N and 10.348°E, elev. 1,900 m, coll. CamHerp L. Chirio, July 9, 2002) – CamHerp 0196, 0695C, 0998C (three specimens, Mbiame, 6.190°N and 10.849°E, elev. 1,955 m, coll. CamHerp M. LeBreton and L. Chirio, July 8, 2002, and December 14, 2002 [0998C]).

This scarce montane species occupies both Cameroon and the Central African Republic (far west). It is not described yet but has numerous morphological affinities with the forms of the *Causus rhombeatus* (Lichtenstein, 1823) group from East and South Africa. In Cameroon, it occupies the Adamaoua high savannas and the Western Highlands where it looks for wet lowlands and the banks of mountain creeks. It is only found at altitude, from 700 m at Ngaouyanga (Adamaoua) up to 1,950 m at Mbiame (BH).

Biogeographic Affinities of the Reptiles of Mt. Oku and the Bamenda Highlands

The 50 reptile species in the study area are classified alphabetically below within each biogeographic region recognized.

Ubiquitous species (1): *Agama agama*.

Forest species from Western and Central Africa (9): *Bitis nasicornis – Boaedon virgatus – Dasypeltis fasciata – Dendroaspis j. jamesoni – Dipsadoboa unicolor – Dipsadoboa weileri – Goniocephalus stenophthalmus – Kinixys homeana – Trachylepis maculilabris*.

Central African forest species (8): *Atheris broadleyi – Atheris squamigera – Bitis gabonica – Bothrolycus ater – Lepidothyris fernandi – Naja melanoleuca – Polemon collaris – Thrasops flavigularis*.

African savanna species (12): *Afrotyphlops* cf. *punctatus – Atractaspis i. irregularis – Bitis a. arietans – Boaedon fuliginosus – Causus maculatus – Chamaeleo gracilis – Crotaphopeltis hotamboeia – Dasypeltis confusa – Dispholidus typus – Grayia tholloni – Hemidactylus angulatus – Naja nigricollis*.

Savanna species with eastern affinities (5): *Chamaeleo laevigatus – Lycophidion multimaculatum – Philothamnus angolensis – Philothamnus hughesi – Psammophis* cf. *phillipsii*.

Endemic Cameroon mountain species (13): *Agama* sp. 2 – *Agama* sp. 4 – *Causus* sp. – *Crotaphopeltis* sp. – *Lacertaspis chriswildi – Lacertaspis lepesmei – Leptosiaphos ianthinoxantha – Leptosiaphos pauliani – Leptosiaphos vigintiserierum – Trachylepis mekuana – Trioceros pfefferi – Trioceros quadricornis gracilior – Trioceros serratus*.

Montane species (2): *Hemidactylus kamdemtohami – Psammophis* sp. 1.

The species composition of our study area located on the Cameroon Volcanic Dorsal is characterized by the presence of a similar number of species in the three dominant elements: savanna forms, forest forms, and endemic montane forms.

Among the 50 reptile species in our study zone there are:

(1) two very anthropophilous species that rise high in elevation in the villages of the region: *Agama agama* and

Table 1. List of the 50 reptile species present in our study area at Mt. Oku and the Bamenda Highlands. For each species we indicate if it is a low elevation or montane species (submontane) (in bold characters) and its altitudinal limits known in Cameroon. For each family we indicate between brackets the number of species in our study area.

		Altitudinal limits in Cameroon (elevation indicated in meters)	
Families	**Species**	**Low elevation species**	**Submontane species**
Testudinidae (1)	*Kinixys homeana*	0–1800	
Agamidae (3)	*Agama agama*	0–2000	
	***Agama* sp. 2**		**1900–2350**
	***Agama* sp. 4**		**1900–2200**
Chamaeleonidae (5)	*Chamaeleo gracilis*	0–1500	
	Chamaeleo laevigatus	350–1550	
	Trioceros pfefferi		**1100–2000**
	Trioceros quadricornis gracilior		**1800–2700**
	Trioceros serratus		**1040–2700**

Table 1 (continued). List of the 50 reptile species present in our study area at Mt. Oku and the Bamenda Highlands. For each species we indicate if it is a low elevation or montane species (submontane) (in bold characters) and its altitudinal limits known in Cameroon. For each family we indicate between brackets the number of species in our study area.

		Altitudinal limits in Cameroon (elevation indicated in meters)	
Families	**Species**	**Low elevation species**	**Submontane species**
Gekkonidae (2)	*Hemidactylus angulatus*	0–2000	
	Hemidactylus kamdemtohami		**1450–1500**
Scincidae (8)	***Lacertaspis chriswildi***		**1000–2800**
	Lacertaspis lepesmei		**2350–2700**
	Lepidothyris fernandi	0–1700	
	Leptosiaphos ianthinoxantha		**1300–2700**
	Leptosiaphos pauliani		**1300–2000**
	Leptosiaphos vigintiserierum		**1000–2450**
	Trachylepis maculilabris	0–2100	
	Trachylepis mekuana		**2400–2700**
Atractaspididae (2)	*Atractaspis i. irregularis*	500–2000	
	Polemon collaris	0–1950	
Colubridae (11)	*Crotaphopeltis hotamboeia*	160–2044	
	***Crotaphopeltis* sp.**		**1050–1500**
	Dasypeltis confusa	500–1550	
	Dasypeltis fasciata	0–2050	
	Dipsadoboa unicolor		**80–2050**
	Dipsadoboa weileri	0–2050	
	Dispholidus typus	350–2150	
	Grayia tholloni	510–1550	
	Philothamnus angolensis	50–2450	
	Philothamnus hughesi	700–2100	
	Thrasops flavigularis	0–2050	
Elapidae (3)	*Dendroaspis j. jamesoni*	0–2000	
	Naja melanoleuca	0–2700	
	Naja nigricollis	0–1800	
Lamprophiidae (5)	*Boaedon fuliginosus*	250–2050	
	Boaedon virgatus	0–1800	
	Bothrolycus ater	0–1800	
	Gonionotophis stenophthalmus	50–1500	
	Lycophidion multimaculatum	500–2450	
Psammophiidae (2)	*Psammophis* cf. *phillipsii*	0–2000	
	***Psammophis* sp. 1**		**1450–2100**
Typhlopidae (1)	*Afrotyphlops* cf. *punctatus*	0–1800	
Viperidae (7)	*Atheris broadleyi*	300–1400	
	Atheris squamigera	0–1500	
	Bitis a. arietans	250–2000	
	Bitis gabonica	0–1500	
	Bitis nasicornis	0–2000	
	Causus maculatus	0–1950	
	***Causus* sp.**		**700–1950**

Trachylepis maculilabris. They both occur as well in West Africa, Central and Eastern Africa. However, note that *T. maculilabris* is an anthropophilic species that requires more moisture than *A. agama*, which only enters in the forest degraded by man;

(2) a mixed group of forest and savanna species that are ecologically tolerant; they are also found in the plains but they often reach 2,000 m in the BH and on the slopes of Mt. Oku. Most of them are also found in West Africa, except *Bothrolycus ater*, *Chamaeleo laevigatus*, *Dendroaspis j. jamesoni*, *Lycophidion multimaculatum*, *Naja melanoleuca* (sensu stricto), *Philothamnus hughesi*, *Polemon collaris*, and *Thrasops flavigularis*, which are limited to the large Central African forest block (and its surrounding areas);

(3) a group of mountain species, endemic or not to the study area: *Agama* sp. 2, *Agama* sp. 4, *Causus* sp., *Crotaphopeltis* sp., *Dipsadoboa unicolor*, *Hemidactylus kamdemtohami*, *Lacertaspis lepesmei*, *Lacertaspis chriswildi*, *Leptosiaphos ianthinoxantha*, *Leptosiaphos pauliani*, *Leptosiaphos vigintiserierum*, *Psammophis* sp. 1, *Trachylepis mekuana*, *Trioceros pfefferi*, *Trioceros quadricornis gracilior*, and *Trioceros serratus*.

Altitudinal Distribution

Among the mountain endemic species of the Cameroon Volcanic Dorsal, *T. quadricornis gracilior*, *T. serratus*, and *L. chriswildi* reach the highest elevations on Mt. Oku, although none occur beyond the treeline where subalpine meadows appear around 2,600 m above sea level (Fig. 22, Table 1). So far, no reptile species has been identified on the summit of Mt. Oku grasslands. However, as with Mt. Cameroon, specific searches for them have not been made, and amphibians are relatively well abundant as potential prey for batrachophagous snakes. It is however a harsh climate for reptiles, with cold nights and frequent frosts.

A clear nomenclature describing the altitudinal distribution patterns observed in Cameroon is difficult as differences between zoological groups are important. Amiet (1971) adopted the biogeographic classification of altitudinal distributions in Cameroon proposed by Letouzey (1968):

1,000 m/1,200 m = low and medium altitude rain forest strata;
1,000 m–1,200 m/1,600–1,800 m = submontane strata;
1,600 m–1,800 m/2,200–2,500 m = montane strata;
2,200 m–2,500 m/3,200–3,600 m = afro-subalpine strata;
above 3,200–3,600 m = afro-alpine strata.

Fig. 22. The altitude grassland of the summit at Mt. Oku no longer harbors any reptile. Chameleons can still be found in the forest on the edge of the meadows, up almost 2,600 m above sea level. However, one can observe there a tiny endemic viviparous toad under the stones on the ground. *Picture: I. Ineich, May 7, 2007.*

Later he (Amiet 1975) defined a "oro-cameroon faunistic element" of species with distributions above 1,000 m elevation. The term "orobiontes" (here replaced with submontane species) was used for these high altitude species. Montane species also present in lower areas around mountains were also distinguished as "monticolous species." Amiet (1987) estimated that the average annual temperature had lowered from 3.5 to 4.5 °C during the last glaciation in Cameroon, and showed that the altitudinal limit of 900 m to 1,000 m is an important ecological boundary, marking the exclusion of many lowland species and the appearance of true submontane species. This boundary in the BH, however was not at 1,000 m elevation but increased to 1,400 m, before a distinctive "submontane" herp assemblage occurs. The further mountain ranges are located from the sea the altitudinal limit for a species appears to increase. The separation of vicariant Cameroon "submontane" reptile assemblage is relatively recent and seems to mainly date from 25,000 to 15,000 BP (Amiet 1987).

Herrmann et al. (2005) presented a detailed study of herpetofauna of Mt. Nlonako, and identified only four of 89 species whose range exceeding 1,700 m altitude: *Trioceros pfefferi* (Chamaeleonidae), *Leptosiaphos vigin-*

tiserierum, *Trachylepis maculilabris* (Scincidae), and *Chamaelycus fasciatus* (Lamprophiidae). They noted that within the Cameroon Volcanic Dorsal a mountain range must exceed a certain altitude to allow the development of an endemic herpetofauna, otherwise faunal exchanges between ranges resulted in the presence of a shared submontane Cameroon biota.

Supraspecific Diversity

Although many reptile families in Cameroon, as in East African mountains, have endemic montane species, e.g., Agamidae, Chamaeleonidae, Scincidae, Psammophiidae, and Viperidae, there is a curious absence of montane Lacertidae in Cameroon. In Kenya, *Adolfus alleni* (Barbour, 1914) and *Adolfus masavaensis* (Wagner et al. 2014) occur in the summit grasslands of the Aberdares and Mt. Kenya, respectively, with ranges from 2,700 to 4,500 m (Spawls et al. 2002). In contrast, there are a number of skinks, particularly small, semifossorial members of the genera *Lacertaspis* and *Leptosiaphos*, that occur above 2,000 m, with *Trachylepis mekuana* and *Lacertaspis lepesmei* being high-altitude endemics.

Mountain dwelling taxa do not necessarily come from the same genera: inside Viperidae, the genera *Atheris* and *Bitis* often possess endemic montane forms sometimes encountered over 3,000 m in East Africa, with the monotypic *Montatheris hindii* being also endemic to montane heathlands. Only the genus *Causus* shows an endemic submontane species in Cameroon which does not even reach 2,000 m elevation. Note, however, that the genus *Atheris* holds endemic species in Cameroon or at least in the Cameroon region (*Atheris broadleyi*, *A. subocularis*), but curiously none of them are limited to the highlands, contrary to what can be observed in East Africa. The strongest affinities between East Africa and Cameroon seem to mainly concern two particularly diverse lizard families on the African continent, Chamaeleonidae and Scincidae (Ineich and Chirio 2004).

Endemism

Endemism at the Cameroon Volcanic Dorsal has a general pattern but with several exceptions. Speciation by vicariance clearly dominates with close but distinct taxa (except for *Trioceros pfefferi*; see our comments above) between separate massifs (e.g., Manengouba and BH-Mt. Oku). The highest peak of the Cameroon Volcanic Dorsal, Mt. Cameroon, an active volcano, is newer than the other summits located further north in the Dorsal. It has no endemic mountain reptiles, however, and this is certainly related to its geological age. However, no detailed study has been undertaken to estimate genetic divergences among disjunct populations of *Trioceros montium* which reaches 1,100–1,200 m at Mt Kupe, but 1,500 m at Manengouba (Anderson and Van Heygen 2013). This species is currently assigned to a single taxon, without subspecific distinction, but may well follow a similar evolutionary pathway like other mountain chameleons of Cameroon.

Threats and Conservation

The threats to this submontane herpetofauna are numerous (Euskirchen et al. 2000). The conservation status of all the endemic species is fragile, and their limited ranges are being rapidly degraded. However, they are characterized by locally high densities, which unfortunately also makes them all the more easy to collect. In fact, species of mountain chameleon from Cameroon are highly sought after for the international exotic pet trade. However, the most serious threat to their existence is the rapid human population growth in the region of Mt. Oku and the Western Highlands. It makes species preservation difficult because human pressure on land for agriculture and livestock, and consequent deforestation, is destructive and growing with little regard to the conservation of endangered species that are increasing in number.

Conclusions

Like most other highland areas, the highest reliefs of Mt. Oku and the BH have only a limited herpetofauna. However the species assemblage is original in its composition. First, it contains a ubiquitous fauna, able to occupy a wide range of habitats from sea level to almost 2,000 m elevation. It also includes typical mountain species unable to survive below 1,000 m, and climbing up to 2,800 m. The vast majority of these latter species, highly specialized at least climatically, are endemic to the Cameroon Volcanic Dorsal and often to a single mountain range. The only study on the herpetofauna of Mt. Oku mentioned only two lizards and seven amphibians, including a scolecomorphid caecilian (Wild 1994). Our work considerably increases this list but unfortunately five potential new species first signaled by Chirio and LeBreton (2007) have still to be described.

The unique herpetofauna of this region is seriously threatened by exponential human growth and its associated impacts. The fertile volcanic soil in the region has always attracted humans, whose expanding population and utilization of natural resources, inevitably encroaches on the fragile habitats of reptiles. Survival and preservation of these populations for future generations must be met with prompt protective actions that are both robust and effective. In addition it must gain the support of the local human population if these endemic species are not to face extinction in the near future.

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