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Miscellanea Herpetologica Gabonica XVII

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Abstract

We present new Gabonese locality records, ecological or morphological data for *Pelusios castaneus* (Pelomedusidae), *Kinixys erosa* (Testudinidae), *Osteolaemus tetraspis* (Crocodylidae), *Agama agama* (Agamidae), *Monopeltis galeata* (Amphisbaenidae), *Feylinia currori*, *Trachylepis polytropis* (Scincidae), *Varanus ornatus* (Varanidae), *Philothamnus hughesi*, *Rhamnophis batesii*, *Toxicodryas adamantea* and *T. blandingii* (Colubridae), *Dendroaspis jamesoni jamesoni* (Elapidae), *Bothrophthalmus brunneus*, *Limaformosa guirali* and *L. savorgnani* (Lamprophiidae), *Atheris squamigera* and *Bitis nasicornis* (Viperidae). One snake species each is newly recorded from Pongara National Park and Nyanga Province, and two each from Batéké Plateau National Park and Haut-Ogooué Province. We refer all records of *Toxicodryas pulverulenta* from Gabon to *T. adamantea*. We discuss the use of camera traps for monitoring reptiles in Gabon based on the results of extensive camera trap surveys. We provide geographic coordinates for selected localities mentioned in MHG III–VI.

Keywords

Biodiversity, herpetofauna, Testudines, Crocodylia, Squamata, camera trap, protected areas, Gabon, Equatorial Africa.

Introduction

Currently without a dedicated local or resident herpetologist, and with only occasional visits by foreign specialists, knowledge of the reptile fauna of Gabon is making slow progress, in spite of an already demonstrated high diversity. To progressively help filling gaps in the natural history and distribution of the reptiles of Gabon, the series *Miscellanea Herpetologica Gabonica* gathers original observations, mostly made by non-herpetologist field workers. Among the authors of the present installment, PAD made his herpetological observations while he was field coordinator for the Aspinall Foundation in the Batéké Plateau National Park in 2015–2016. The observations by JAZ were made during camera trap surveys to study the wildlife in various forestry concessions across Gabon; those of JLB were made during logging activities of the *Compagnie des Bois du Gabon* (CBG).

In addition to the new records presented here, we provide geographical coordinates for selected records made in former installments of the series, so that those older records can be precisely mapped (Table 2).

Material and Methods

The camera traps used by JAZ were set to take motion-triggered photos, and some also to take time-lapse photos every 15 minutes regardless of whether motion was detected. The difference in number of observations of reptiles between motion and time-lapse photos provides an indication of the efficacy of camera traps for monitoring reptiles (see Table 1). All camera traps (Bushnell Trophy Cam HD) were installed in grids with 1-km inter-camera spacing. New photographic material was identified using the keys and morphological information provided by Pauwels and Vande weghe (2008), Pauwels, Albert et al. (2010) and Pauwels, Morelle et al. (2019). Snake ventral scales were counted according to the method of Dowling (1951).

Abbreviations: Morphology: MSR = dorsal scale rows at midbody. Varia: asl = above sea level; Dept = Department; NP = National Park; Prov. = Province.

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Table 1. Results of camera traps in logging concessions.

Logging company / concession	Number of cameras	Length of survey (days)	Total camera trap days	Motion triggered / Time-lapse	Reptile observations
Rougier Gabon – Haute Abanga	36	92	3312	Motion	2 × *Varanus ornatus*
TLP (Tropical Logs Production)	36	102	3672	Motion	3 × *Varanus ornatus*
FDG (Forestry Development Gabon)	36	62	2232	Motion	1 × *Varanus ornatus*
Rougier Gabon – Ogooué-Ivindo	28	76	2128	Motion & Time-lapse	2 × *Osteolaemus tetraspis* 1 × *Kinixys erosa* (both with Time-lapse)
BSO (Bois et Scierie de l'Ogooué)	29	90	2520	Motion & Time-lapse	2 × *Varanus ornatus* (both with Motion)
Various other concessions	166	various	12990	Motion	None

Results

Testudines
Pelomedusidae
Pelusios castaneus (Schweigger, 1812)
On 24 August 2019 JLA photographed an adult female individual 5 km south of Nyonié camp, Komo-Océan Dept, Estuaire Prov. (Figure 1). It was crossing a path at 6.15 P.M. between two forest patches in a coastal savanna. New locality record (Maran and Pauwels, 2005).

Testudinidae
Kinixys erosa (Schweigger, 1812)
On 26 April 2019 at 22.46 P.M., a time-lapse camera trap installed by JAZ in a *Rougier Gabon* logging concession (0°27'39.0"N, 11°45'43.8"E; alt. 453 m asl) in Lopé Dept, Ogooué-Ivindo Prov., photographed an adult Serrated hinge-backed tortoise (Table 1). New locality record (Pauwels and Vande weghe, 2008). Another adult was encountered by day on 16 February 2020 by JAZ on a logging road (1°54'11.6"S, 10°26'11.1"E) in Ndolou Dept, Ngounié Prov. (Figure 2). New locality record. Within the dept, the species has been listed, but not vouchered, from Mandji (Maran and Pauwels, 2005).

Crocodylia
Crocodylidae
Osteolaemus tetraspis Cope, 1861
On 5 and 18 April 2019 at respectively 3.15 A.M. and 21.29 P.M., a time-lapse camera trap installed by JAZ in a *Rougier Gabon* logging concession (0°25'28.7"N, 11°45'38.2"E; alt. 439 m asl) in Lopé Dept, Ogooué-Ivindo Prov., photographed an adult Dwarf crocodile (Table 1). New locality record (Pauwels and Vande weghe, 2008).

Squamata
Agamidae
Agama agama (Linnaeus, 1758)
On 3 October 2008 OSGP observed an adult male foraging in the late afternoon on the external wall of the *Le Méridien* hotel (0°22'40.6"N, 9°27'11.8"E) in Libreville, Estuaire Prov. It went straight up towards the top floor, at about 20 m above the ground (Figure 3). Very few data on maximum foraging heights for *Agama agama* in urban environments are available. On a house wall in Tchibanga in southern Gabon, Pauwels, Burger et al. (2004) reported foraging heights of 3 m above the ground. In southern Nigeria Amadi et al. (2020) recorded individuals foraging on walls at nearly 3 m above the ground.

Amphisbaenidae
Monopeltis galeata (Hallowell, 1852)
On 29 May 2019 JLB photographed an adult individual of this rarely encountered species at about 10 km south of Lake Divangui (thus ca. 2°01'22.4"S, 9°59'07.0"E), Ndougou Dept, Ogooué-Maritime Prov. (Figure 4). This individual was unearthed during

Figure 1. Ventral view of an adult female *Pelusios castaneus* near Nyonié camp, Estuaire Prov., northwestern Gabon. Photograph by J.-L. Albert.

Figure 2. Adult *Kinixys erosa* in Ndolou Dept, Ngounié Prov. Photograph by J. A. Zwerts.

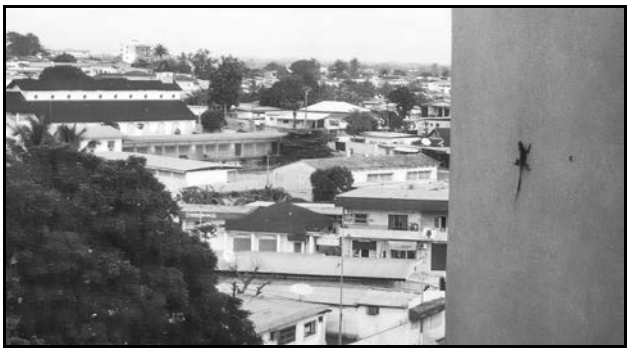

Figure 3. Adult male *Agama agama* on the wall of Le Méridien hotel in Libreville, Estuaire Prov. Photograph by O. S. G. Pauwels.

a logging operation. It was visible for a very short moment before it dug back into the soil. New locality. The closest other known localities are situated in Etimboué Dept of the same province (Branch et al., 2003).

Scincidae

Feylinia currori Gray, 1845

A freshly dead individual, about 20 cm total length and with two supranasal scales was found on 25 July 2020 by CVi along the Nyonié River in Nyonié, Komo-Océan Dept, Estuaire Prov. (Figure 5). The cause of its death is unknown. New dept record (Pauwels and Vande weghe, 2008). As is the case with amphisbaenians as well, fossorial skinks are rarely encountered, and new observations in Gabon still often represent new locality records.

Trachylepis polytropis Boulenger, 1903

On 7 November 2005, JLB caught and released an adult Multicarinated skink in the garden of the headquarters of the CBG base camp (1°50'37.6"S, 9°48'10.1"E), Etimboué Dept, Ogooué-Maritime Prov. (Figure 6). It was found active by day on the leaf litter at the edge of the forest. It showed supranasals in contact by a point, and prefrontals in wide contact. New locality. The closest earlier records were made in Rabi oil concession (Pauwels, Burger et al., 2006). The distribution of this skink in Gabon is still poorly documented.

Varanidae

Varanus ornatus (Daudin, 1803)

On 6 September 2019 at 2.55 P.M., a camera trap installed by

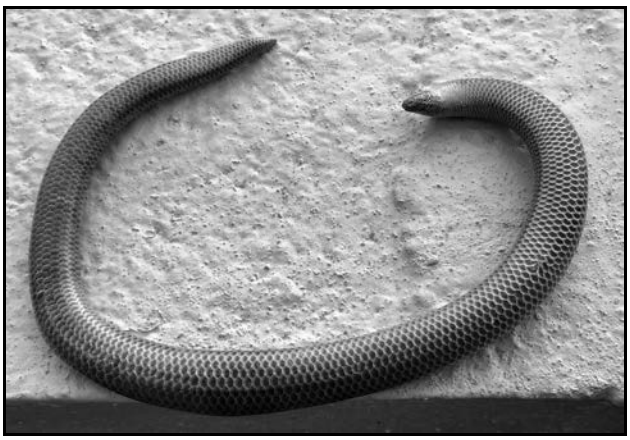

Figure 5. *Feylinia currori* found dead along Nyonié River, Komo-Océan Dept, Estuaire Prov. Photograph by C. Vigna.

Figure 4. Adult *Monopeltis galeata*, *in situ* in Ndougou Dept, Ogooué-Maritime Prov., southwestern Gabon. Photograph by J. L. Bonnin.

JAZ in a *Rougier Gabon* logging concession (0°39'41.4"N, 11°02'15.6"E; alt. 488 m asl) in Okano Dept, Woleu-Ntem Prov. (Table 1), photographed an adult Ornate monitor foraging on the ground. Another observation was made in the same concession on 9 October 2019 at 3:13 P.M. (0°41'19.7"N, 11°01'10.2"E; alt. 474 m asl; Figure 7). In the same dept two specimens were observed on a motion-triggered camera trap in a concession of *Bois et Scierie de l'Ogooué* (BSO; 0°32'13.3"N, 11°35'50.3"E; alt. 440 m asl; Table 1), on 6 April and 24 May 2019 at respectively 13.42 P.M. and 9.34 A.M. New locality records; previously the species was recorded from a single locality within this dept (Pauwels and David, 2008).

Three more observations were made on a logging road in a concession of *Tropical Logs Production* (TLP; 0°54'52.1"N, 10°30'43.2"E; alt. 554 m asl; Haut Komo Dept, Woleu-Ntem Prov.) on 17, 22 and 23 September 2019 at 15:09 P.M., 12:11 P.M. and 12:49 P.M., respectively. A single locality had been recorded previously for this species in this dept (Pauwels, Kamdem Toham et al., 2002).

On 1 January 2020 at 11:43 A.M., another camera trap in a *Forestry Development Gabon* (FDG) logging company's concession (1°42'43.1"S 10°13'45.2"E; alt. 185 m asl) in Ndolou Dept, Ngounié Prov., photographed an adult individual active on the ground. New locality record (Pauwels and Vande weghe, 2008).

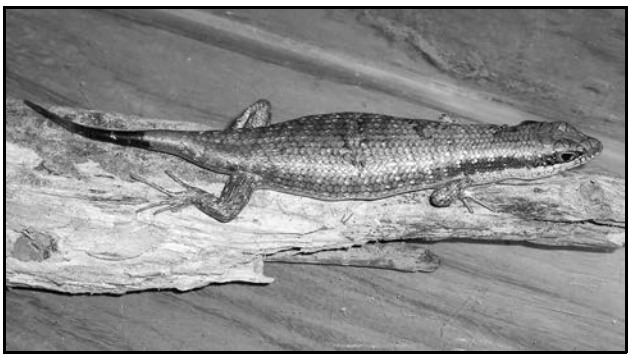

Figure 6. Live adult *Trachylepis polytropis* in Etimboué Dept, Ogooué-Maritime Prov., southwestern Gabon. Photograph by J. L. Bonnin. Note the regenerated tail.

Figure 7. Live adult *Varanus ornatus* in a logging concession in Okano Dept, Woleu-Ntem Prov., northern Gabon. Camera trap photograph by J. A. Zwerts.

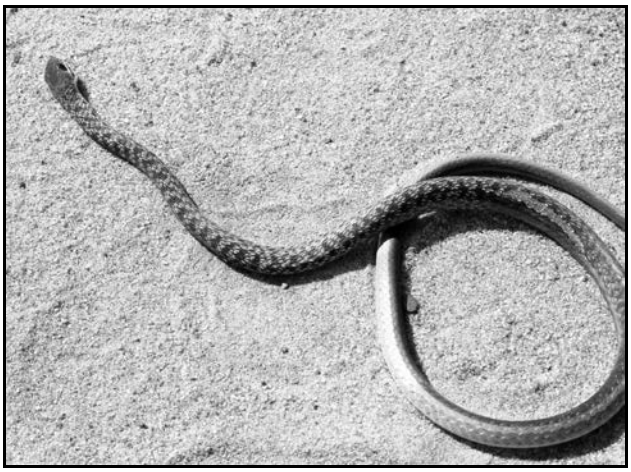

Figure 8. Freshly dead-on-road adult *Philothamnus hughesi* near Moanda, Haut-Ogooué Prov., southeastern Gabon. Photograph by C.-A. Boupoya-Mapikou.

Figure 9. Live *Rhamnophis batesii* in Mouloundou Dept, Ogooué-Lolo Prov., southeastern Gabon. Photograph by R. Ndonda Makemba.

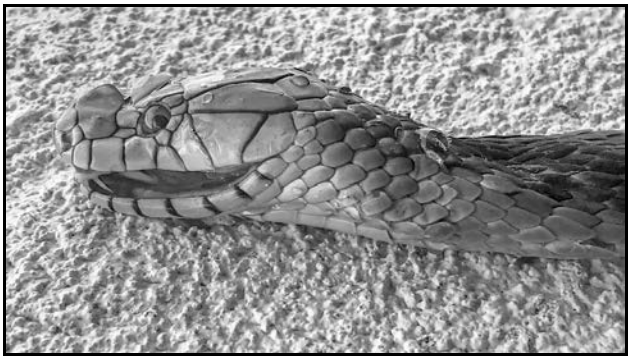

Figure 10. Freshly dead-on-road adult *Dendroaspis jamesoni jamesoni* near Nyonié, Estuaire Prov., western Gabon. Photograph by C. Vigna. The head is heavily damaged.

Figure 11. Live adult *Bothrophthalmus brunneus* in Batéké Plateau NP, Haut-Ogooué Prov., southeastern Gabon. Photograph by P. A. Dupeyras.

Figure 12. Live adult *Limaformosa guirali* in Batéké Plateau NP, Haut-Ogooué Prov., southeastern Gabon. It is flicking its dark pink tongue. Photograph by P. A. Dupeyras.

All monitors photographed by camera trap showed five dorsal transverse rows of ocellae between fore- and hind-limb insertions, a pattern typical of *Varanus ornatus*. A simultaneous camera trap survey effort in various other concessions across Gabon revealed no reptiles (Table 1).

Colubridae

Philothamnus hughesi Trape & Roux-Estève, 1990

On 25 October 2018 CABM photographed a freshly dead-on-road adult individual in a savanna area (1°35'37.1"S, 13°16'49.6"E) located SE of Moanda in Lébombi-Léyou Dept, Haut-Ogooué Prov. (Figure 8). It showed smooth dorsal scales, a dark green head, irregular blue and black oblique bars on the neck, and a bronze dorsum irregularly dotted with black. The two photographs taken allow seeing that on the right side of the head, there are eight supralabials of which the 4th and 5th contact the orbit, and that the temporal formula is 1+1. First Dept record. This relatively recently described, colorful species was confirmed from Gabon only two years ago (Pauwels, Morelle et al., 2019), and only two Gabonese localities were known previously, both in Lékoko Dept.

Rhamnophis batesii (Boulenger, 1908)

On 26 March 2020 RNM photographed a Bates's tree snake active by day in a forest (0°49'15.1"S, 13°16'57.1"E; alt. 345 m asl) near Mamidi in Mouloundou Dept, Ogooué-Lolo Prov. (Figure 9). Photographs in ventral view show keeled ventrals, a single anal scale and divided subcaudals. New locality record (Pauwels and Vande weghe, 2008; Carlino and Pauwels, 2015). There are still only a very few records of this arboreal snake in Gabon; it is much more rarely observed in the country than the congeneric *Rhamnophis aethiopissa aethiopissa*, for reasons that are still unknown to us.

Toxicodryas adamantea Greenbaum, Allen, Vaughan, Pauwels, Wallach, Kusamba, Muninga, Mwenebatu, Mali, Badjedjea, Penner, Rödel, Rivera, Sterkhova, Johnson, Tapondjou & Brown, 2021

The caption of the photograph presented by Spawls and Branch (2020: 239) to illustrate *Toxicodryas pulverulenta* gives "Gabon" as locality, without more precision. The young individual on the photograph was actually found in Rabi oil concession (ca. 1°55'34.5"S, 9°52'12.8"E), Etimboué Dept, Ogooué-Maritime Prov., by the late Bill Branch (author of the photograph), Marius Burger and OSGP. Following the revision of the genus *Toxicodryas* by Greenbaum et al. (2021), all records of *T. pulverulenta* from Gabon should be referred to *T. adamantea*.

Toxicodryas blandingii (Hallowell, 1844)

Spawls and Branch (2020: 238) provided the photograph of a young individual from "Gabon." It was more precisely taken in the garden of the villa (Case 62; 2°46'21.0"S, 10°02'02.6"E) which OSGP occupied from 2004 to 2011 in Yenzi near Gamba, Ogooué-Maritime Prov. The Blanding's tree snake was the most often encountered snake species in this garden during this period. *Toxicodryas adamantea*, found by OSGP in syntopy in the same garden, was comparatively very rare.

Elapidae

Dendroaspis jamesoni jamesoni (Traill, 1843)

In the early morning of 17 May 2020 CVi found a freshly dead-on-road individual (about 1.7 m total length) near the *Campement Chez Beti* (0°02'22.2"S, 9°20'23.7"E), Komo-Océan Dept, Estuaire Prov. (Figure 10). Jameson's mamba was recently found for the first time in Estuaire Prov., where it is so far known from only a few localities (Pauwels, Bamba Kaya et al., 2020; Pauwels, Chirio et al., 2017; Pauwels, Pauly et al., 2020).

Lamprophiidae

Bothrophthalmus brunneus Günther, 1863

On 16 April 2015 PAD photographed an individual at night in the northern part of Batéké Plateau NP, Plateaux Dept, Haut-Ogooué Prov., in direct proximity to human settlements. Its dorsum is uniformly brown (Figure 11). The dorsal surface of its head is brown-orange, indicating that it is adult (young individuals show a whitish head). New record for the park and for Haut-Ogooué Prov. (Pauwels and Vande weghe, 2008; Pauwels, 2016). This is the southeasternmost record of the genus *Bothrophthalmus* in Gabon and, like all other Gabonese records, it is not a lineated individual. *Bothrophthalmus lineatus* Peters, 1863, although mentioned several times by various authors from Gabon, is unvouchered from the country and should not be treated as a synonym of the uniformly brown form *B. brunneus* (Pauwels and Vande weghe, 2008; Pauwels and Brecko, 2020).

Limaformosa guirali (Mocquard, 1887)

On the evening of 17 April 2015 PAD encountered an adult Guiral's file snake in the northern part of Batéké Plateau NP, Plateaux Dept, Haut-Ogooué Prov. (Figure 12). Photographs of its whole body and of the right side of its head show a uniformly black dorsum (i.e., without a white spot on each scale), a white belly (the black dorsal color extends to the edges of the ventrals), a relatively short tail, 15 MSR, strongly keeled dorsals with a vertebral row bearing a double keel, a frontal of about the same length as the parietals, a divided nasal, a single loreal,

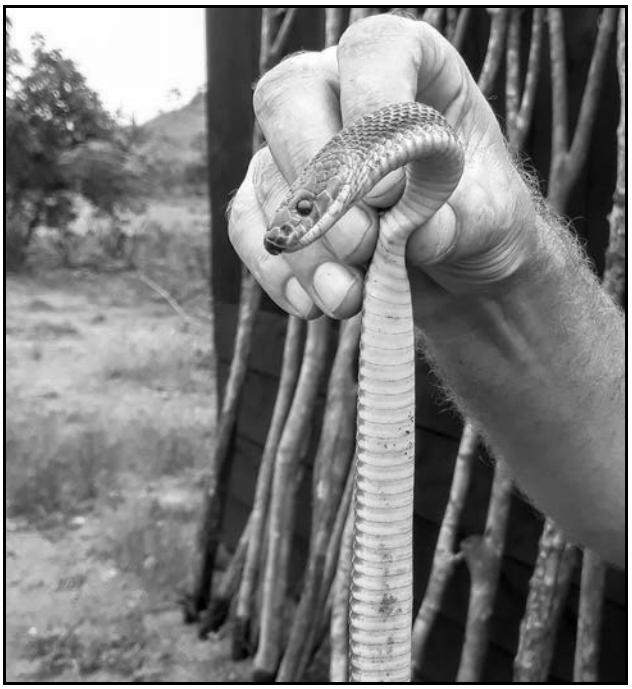

Figure 13. Live adult *Limaformosa savorgnani* near Tchibanga, Nyanga Prov., southern Gabon. Photograph by A. E. Ruizendaal.

Figure 14. Live subadult *Atheris squamigera* in Mouloundou Dept, Ogooué-Lolo Prov., southeastern Gabon. Photograph by R. Ndonda Makemba.

2 preoculars, 2 postoculars, 7 supralabials of which the 3rd, 4th and 5th contact the orbit, 8 infralabials, and 2 anterior temporals. New record for the park and for Haut-Ogooué Prov. (Pauwels and Vande weghe, 2008; Pauwels, 2016; Pauwels, Gillet et al., 2018). With the present additions of *Bothrophthalmus brunneus* and *Limaformosa guirali*, 18 reptile species are now recorded from Batéké Plateau NP, obviously only a fraction of the actual number of species inhabiting the park.

Limaformosa savorgnani (Mocquard, 1887)
An adult individual was found by AER on 19 May 2020 inside a house (2°57'35.8"S, 10°59'45.9"E) near Tchibanga in Mougoutsi Dept, Nyanga Prov. Various photographs of its body (among them Figure 13) show a black dorsum with a white spot on each scale, a white belly (the black dorsal color extends to the edges of the ventrals), a relatively short tail, 15 MSR, strongly keeled dorsals with a vertebral row bearing a double keel, a frontal as broad as long, shorter than the parietals, a divided nasal, 1/1 loreal, 1/1 preocular, 0/0 postocular (fused on each side with the supraocular), 7(3-4)/7(3-4) supralabials, 8(5)/8(5) infralabials, 1/1 anterior temporal, about 220 keeled ventrals, a single anal and a complete tail with 52 divided subcaudals. Parietal and frontal scales rugose. Its total length is about 102 cm. New prov. record (Pauwels and Vande weghe, 2008; Pauwels and Sallé, 2009; Dewynter et al., 2017; Pauwels, Albert et al., 2017; Pauwels, Bamba Kaya et al., 2020).

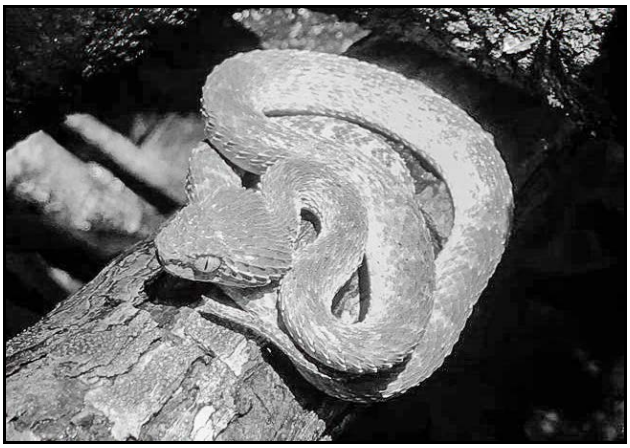

Figure 16. Live subadult *Atheris squamigera*. *In situ* in Pongara National Park, northwestern Gabon. Photograph by J. Fourie.

Figure 15. Live adult *Atheris squamigera* in Mouloundou Dept, Ogooué-Lolo Prov., southeastern Gabon. Photograph by R. Ndonda Makemba.

Viperidae
Atheris squamigera (Hallowell, 1856)
On 24 and 25 March 2020 RNM encountered a subadult and an adult Green tree viper in forest sites (0°49'51.0"S, 13°17'6.8"E, alt. 373 m asl, and 0°49'14.6"S, 13°17'3.2"E, alt. 350 m asl, respectively) near Mamidi in Mouloundou Dept, Ogooué-Lolo Prov. (Figures 14 and 15). Photographs in ventral view of the second individual showed its single anal and allowed counting its single preventral and 157 ventrals. Both showed a green dorsal color, with poorly contrasted irregular transverse bands in the subadult. New localities (Pauwels, Chirio et al., 2017). On 1 April 2020 at 11.40 A.M. JF photographed a subadult individual in a forest (ca. 0°12'10.1"N, 9°19'13.7"E) in the western part of Pongara NP, Komo-Océan Dept, Estuaire Prov. (Figure 16). New record for the park and for the dept (Pauwels, Le Garff et al., 2016; Pauwels, Chirio et al., 2017). Including this new record, 26 reptile species are currently recorded from Pongara NP (Pauwels, 2016; Pauwels, Albert et al., 2017; Pauwels, Gillet et al., 2018), a list that is certainly still very incomplete.

Bitis nasicornis (Shaw, 1802)
An adult Nose-horned viper was photographed by JLB on 13 Sept. 2014 at the CBG base camp (1°50'37.6"S, 9°48'10.1"E), Etimboué Dept, Ogooué-Maritime Prov. (Figure 17). New locality. The closest records were made in Rabi oil concession (Pauwels, Burger et al., 2006). On 10 December 2017 CVe

Figure 17. Live adult *Bitis nasicornis* in Etimboué Dept, Ogooué-Maritime Prov., southwestern Gabon. It is flicking its black tongue. Photograph by J. L. Bonnin.

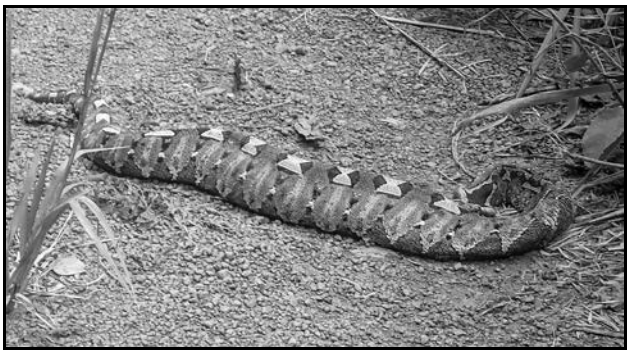

Figure 18. Freshly dead-on-road adult *Bitis nasicornis* near Bambidié, Ogooué-Lolo Prov., eastern Gabon. Photograph by C. Vermeulen.

photographed an adult individual (Figure 18) on a laterite road (0°46'00.0"S, 12°54'00.0"E) near Bambidié, in a concession of the *Compagnie Equatoriale des Bois* (CEB), Mouloundou Dept., Ogooué-Lolo Prov. The freshly dead snake had just been run over by a car whose driver ate the viper the same day. New locality record (Pauwels and Vande weghe, 2008).

Remark on camera traps for reptile monitoring in Gabon

In the extensive camera trap surveys of JAZ (Table 1), only eight observations of reptiles, all of adult *Varanus ornatus*, were made with motion-triggered cameras. A small portion of the cameras was also set up to take time-lapse photos on 15-minute intervals, thereby not depending on heat and/or motion triggers. Interestingly, the time-lapse cameras observed two other reptile species, in particular adult *Kinixys erosa* and *Osteolaemus tetraspis*. A potential explanation for the lack of observations of these species on motion-triggered cameras is that these species may move too slow to trigger the camera. Time-lapse camera trapping partly addresses this issue, but comes at the cost of producing enormous numbers of empty images with related data processing costs. Overall, it can be concluded that camera trapping is of limited value for herpetological inventories due to limited detection.

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Table 2. Geographic coordinates for selected localities mentioned in Miscellanea Herpetologica Gabonica (MHG) III–VI (localities alphabetically arranged).

Localities	Province	Coordinates	MHG
Akiéni (ca. 10 km S of)	Haut-Ogooué, Lékoni-Lékori Dept	1°15'07.6"S, 13°55'23.3"E	IV
Bakoumba	Haut-Ogooué, Lékoko Dept	1°49'43.5"S, 13°00'08.7"E	V–VI
Boussimbi	Ogooué-Lolo, Offoué-Onoy Dept	1°10'32.0"S, 11°49'16.0"E	IV
Hôtel Tropicana, Libreville	Estuaire Prov., Libreville Dept	0°26'56.3"N, 9°24'43.1"E	V–VI
Terminal pétrolier	Ogooué-Maritime, Ndougou Dept	2°46'41.7"S, 10°01'12.2"E	III
Wagny	Ogooué-Lolo, Mouloundou Dept	0°34'31.3"S, 12°17'21.6"E	IV
Yenzi	Ogooué-Maritime, Ndougou Dept	2°46'04.0"S, 10°01'36.4"E	III

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