



Checklist of the amphibians and reptiles of the Lely Mountains, eastern Suriname

Rawien Jairam

National Zoological Collection of Suriname, Anton de Kom University, Paramaribo, SURINAME

Abstract.—The Lely Mountains in Suriname have been surveyed only a few times by various herpetologists since 1973, and most recently in June 2016 by three people during six days. The total number of species recorded from the Lely Mountains is 102, including 46 species of amphibians and 41 species of reptiles in the 2016 surveys, with 15 additional species from the previous survey. Pluviometric conditions were not favorable during the survey, so more species of amphibians likely remained undetected. The use of only active searches probably only allowed detection of a portion of the reptile fauna of the massif. Unfavorable weather and the relatively small area sampled indicate that the diversity of the herpetofauna of the Lely Mountains is probably far from being completely documented. The presence of roads established for illegal gold mining and other human structures, such as a communication tower, have caused significant forest degradation.

Keywords. Anura, conservation, herpetofauna, Lacertilia, laterite landscape, new records, Serpentes, South America, Testudines

Citation: Jairam R. 2019. Checklist of the amphibians and reptiles of the Lely Mountains, eastern Suriname. *Amphibian & Reptile Conservation* 13(2) [General Section]: 160–171 (e200).

Copyright: © 2019 Jairam. This is an open access article distributed under the terms of the Creative Commons Attribution License [Attribution 4.0 International (CC BY 4.0): <https://creativecommons.org/licenses/by/4.0/>], which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. The official and authorized publication credit sources, which will be duly enforced, are as follows: official journal title *Amphibian & Reptile Conservation*; official journal website: amphibian-reptile-conservation.org.

Received: 18 October 2018; **Accepted:** 15 May 2019; **Published:** 14 November 2019

Introduction

Presently the herpetofauna of Suriname consists of approximately 303 species (Ouboter 2017). Although over 90% of Suriname is still covered by natural vegetation, only a few studies have assessed the herpetofaunal diversity of Suriname throughout the entire territory (Hoogmoed 1973; Ouboter and Jairam 2012) leaving many areas still unexplored. Herpetofaunal surveys in specific areas have been conducted by several researchers (Ouboter et al. 2007, 2011; Nielsen et al. 2013; Fouquet et al. 2015a,b). New country records are still being documented, e.g., *Amapasaurus tetradactylus* (Jairam and Jairam-Doerga 2015), and range extensions continue to be reported, e.g., *Ptychoglossus brevifrontalis* (Jairam and Jairam-Doerga 2016).

The Lely Mountains are located in the eastern part of Suriname (4°25'–4°45'N, 54°39'–54°55'W) and together with the Brownsberg, Nassau, Winti Wai, Hoka-Hin, Stonbroekoe, and Majordam Mountains they form a system of laterite-bauxite plateaus in northeastern Suriname. These small plateaus form a unique type of landscape (H. ter Steege, pers. comm.) with different vegetation types, including high forest, savannah forest, and rocky creek beds (Alonso and Mol 2007). The Lely

Mountains together with the Brownsberg and the Nassau Mountains comprise a bauxite concession of the Suriname Aluminum company (Suralco), which formerly operated in Suriname (Mol et al. 2007). Although Suralco explored the Lely Mountains for bauxite deposits, the company did not proceed with the mining exploitation. The Lely Mountains consist of several plateaus with a maximum height of approximately 700 m (Alonso and Mol 2007). Due to the absence of established roads for cars, the Lely Mountains are mainly accessible only by air. A trail that is used by gold miners going up the Lely Mountains by means of all-terrain vehicles is long and tedious, and seldom without dangers. These circumstances have led to relatively few surveys (Hoogmoed 1974, 1975, unpub.; Watling and Ngadino 2007) at this location when compared to other nearby bauxite mountains, such as the Brownsberg Mountain. The remoteness of this location may also favor the occurrence of microendemics and/or rare species such those as in *Anomaloglossus* (Vacher et al. 2017). However, information about the herpetofauna of the Lely Mountains is still scant. This report documents new findings from the herpetofauna surveyed in the Lely Mountains in June 2016, and presents an overview of the herpetofaunal diversity observed and an updated list for this location.

Correspondence. rawien_2000@yahoo.com

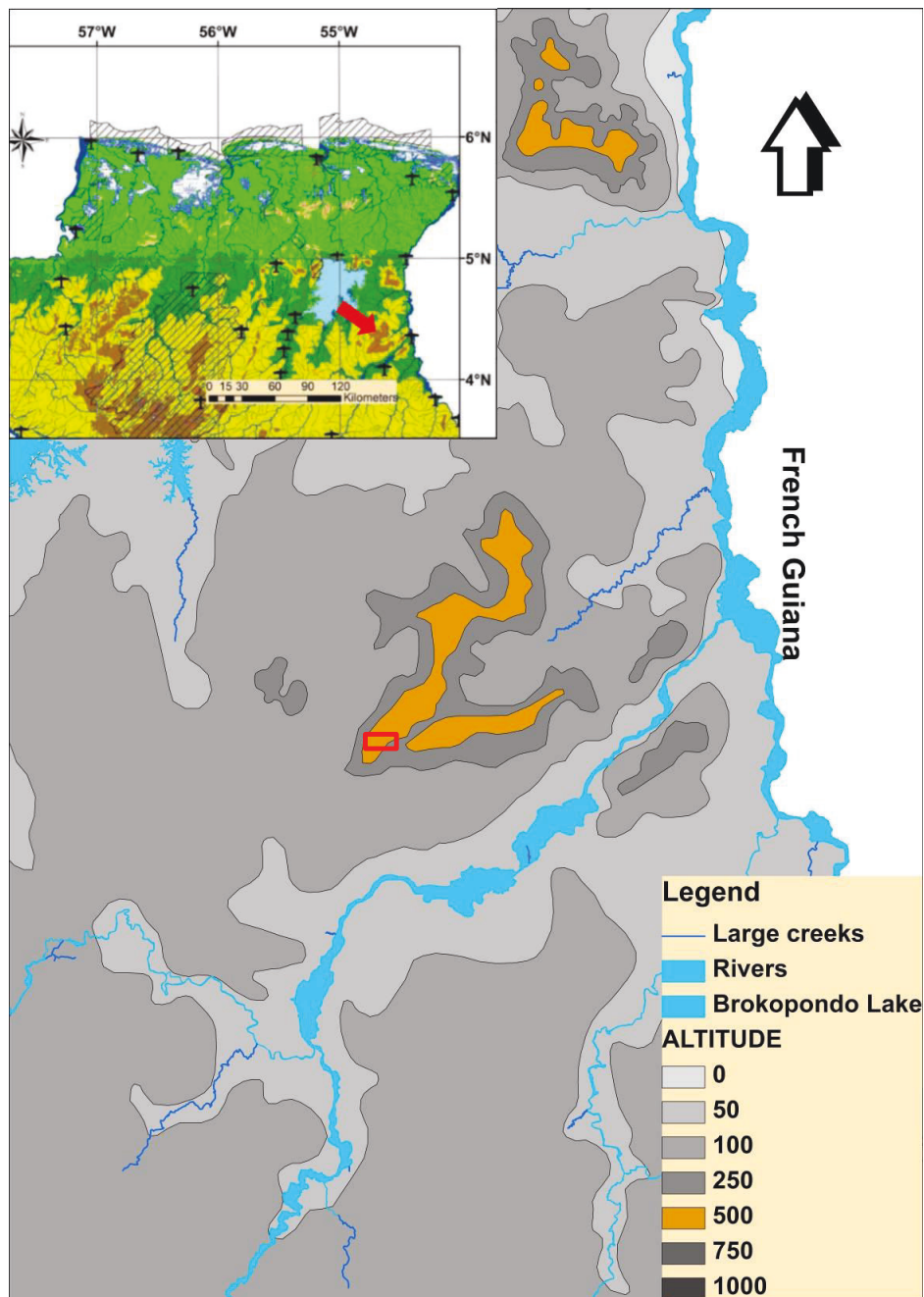


Fig. 1. Map of the Lely Mountains plateau showing the area surveyed in the red square. The inset image shows the location of the Lely Mountains in Suriname, as indicated by the red arrow. In the right upper side of the figure the Nassau Mountains are visible.

Materials and Methods

Habitat description. The vegetation and water drainages in the Lely Mountains are presently heavily disturbed locally by illegal small-scale gold miners. Some of the areas sampled were the airstrip, which was covered with grass, and small ditches located on one side for water drainage. The area around the airstrip was surrounded by patches of pristine forest interspersed with disturbed forests. The vegetation in the disturbed areas included mostly trees that were approximately two m high. The cause of this disturbance could have been the establishment of the airstrip by Suralco. The

bauxite company also established roads that extend from the plateau to the northern part of the Lely Mountains. The aforementioned roads were usually dominated by large water filled potholes bordered by small shrubs and bushes. Also sampled was a small creek on the plateau, which was heavily disturbed by artisanal gold mining.

Survey methods. Three people opportunistically surveyed the forest of the Lely Mountains using available roads and trails for six days. Trails and roads were surveyed radiating in different directions from the airstrip (Fig. 1). The surveyors also walked through the forest away from trails to increase the chance of finding amphibians and

reptiles. Night surveys started at dusk, at approximately 19.00 h, and usually lasted up until 24.00 h into the night. Amphibians and reptiles were actively searched for and were collected by hand when encountered. Call records were made for calling amphibians using a Marantz recorder with an external microphone. All recorded calls were analyzed using the software Audacity (<http://audacityteam.org>) and compared against currently known anuran call databases. Pools on the road and in other potential locations were checked for tadpoles. Searches for amphibians and reptiles were conducted during the day. All collected specimens were photographed, and afterwards were sedated and sacrificed in the field using Lidocaine®. Specimens were preserved in 10% formalin (one part full-strength formaldehyde and nine parts water) and after a few days they were transferred to 70% ethanol for storage at the National Zoological Collection of Suriname (NZCS). The identities of some of the amphibian specimens collected were verified by molecular analyses, as indicated in Table 1. Additionally, some data are provided below on the habitats where the species were collected, and whether they are documented here for the first time for the Lely Mountains.

Historical survey data. To complete the present list of species known from the Lely Mountains searches were performed in the online databases from Naturalis (<http://bioportal.naturalis.nl>) and GBIF (<https://www.gbif.org/species/search>) to check for species from this location that were not formally mentioned in the published literature. Figure 2 gives an overview of the total number of species documented in the three herpetological surveys at the Lely Mountains (Hoogmoed in 1974/5, Watling and Ngadino in 2006, and the fieldwork reported here in 2016).

Results

A total of 28 species of amphibians, representing seven families, and 18 species of reptiles in 11 families, were collected (Figs. 3–8). All specimens were unambiguously identified to the species level. Previously, 19 anuran species were recorded for the Lely Mountains (Watling and Ngadino 2007). The two lists combined yield a total of 29 species, eight of which were never before documented for the Lely Mountains. For the Lely Mountains, the RAP (Rapid Assessment Program) reported a total of 18 reptile species (Watling and Ngadino 2007); the present survey also collected a total of 18 species, seven of which were new records for this location. Database searches of Naturalis (<http://bioportal.naturalis.nl>) and GBIF (<https://www.gbif.org/species/search>) provided a total of 34 anuran species, 17 of which were not documented during either the RAP or the survey held in June 2016. For reptiles, Naturalis and GBIF yielded a total of 25 species, 13 of which were not documented in the surveys. Taking into account all of the surveys and database reports for the Lely Mountains yields a total of 46 anurans and 41 reptiles identified to the species level (Table 1).

Some noteworthy observations were made for some of the amphibian and reptile species collected in June 2016.

- *Anomaloglossus stepheni* was collected for the first time in the Lely Mountains. Specimens were collected in the leaf litter in a patch of dry pristine forest approximately one km north of the airstrip.
- *Boana xerophylla* is formally reported for the first time for the Lely Mountains, and was collected during the

Table 1. Amphibian and reptile species reported for Mount Lely, Suriname. Data are included from three main sources: the Rapid Assessment Program (“RAP 2007”), the current survey conducted in June 2016 (“Current 2016”), and all others from literature surveys and online sources (“Other”). The latter include literature references, when available, and asterisks indicate the original collector(s), when known. For species only reported from one of these three sources, the table cells are color coded (yellow, green, or blue), which emphasizes the inherently “incomplete” nature of any individual survey. The last column (“Seq”) indicates whether sequences are available.

Higher taxa	Species	RAP 2007	Current 2016	Other	Original collector/literature citation	Seq
Amphibia: Anura						
Aromobatidae	<i>Anomaloglossus stepheni</i>		X			
Aromobatidae	<i>Allobates femoralis</i>		X	X	Hoogmoed 1975*	X
Aromobatidae	<i>Allobates granti</i>		X	X	Noonan and Gaucher 2005	X
Bufonidae	<i>Rhinella marina</i>	X	X	X	Hoogmoed 1975*	X
Bufonidae	<i>Rhinella martyi</i>		X	X	Fouquet et al. 2007	X
Bufonidae	<i>Rhinella margaritifera</i> species complex	X				
Bufonidae	<i>Rhaebo guttatus</i>			X	Hoogmoed 1975*	
Bufonidae	<i>Atelopus hoogmoedi</i>			X	Ouboter and Jiram 2012	
Dendrobatidae	<i>Ameerega trivitata</i>	X	X			

Table 1 (continued). Amphibian and reptile species reported for Mount Lely, Suriname. Data are included from three main sources: the Rapid Assessment Program (“RAP 2007”), the current survey conducted in June 2016 (“Current 2016”), and all others from literature surveys and online sources (“Other”). The latter include literature references, when available, and asterisks indicate the original collector(s), when known. For species only reported from one of these three sources, the table cells are color coded (yellow, green, or blue), which emphasizes the inherently “incomplete” nature of any individual survey. The last column (“Seq”) indicates whether sequences are available.

Higher taxa	Species	RAP 2007	Current 2016	Other	Original collector/literature citation	Seq
Amphibia: Anura						
Hylidae	<i>Boana boans</i>		X	X	Hoogmoed 1975*	X
Hylidae	<i>Boana xerophylla</i>		X			X
Hylidae	<i>Dendropsophus leucophyllatus</i>		X	X	Hoogmoed 1975*	
Hylidae	<i>Dendropsophus minutus</i>	X	X	X	Hoogmoed 1975*	
Hylidae	<i>Dendropsophus melanargyreus</i>			X	Hoogmoed and Avila Pires 1991	
Hylidae	<i>Dendropsophus gaucheri</i>			X	Fouquet et al. 2011	
Hylidae	<i>Osteocephalus oophagus</i>		X			
Hylidae	<i>Osteocephalus taurinus</i>	X		X	Hoogmoed 1975*	
Hylidae	<i>Osteocephalus leprieuri</i>			X	Ouboter and Jairam 2012	
Hylidae	<i>Osteocephalus helenae</i>			X	Hoogmoed and Polder 1975*	
Phyllomedusidae	<i>Pithecopus hypochondrialis</i>		X	X	Myers 1975	
Phyllomedusidae	<i>Callimedusa tomopterna</i>		X	X	Hoogmoed 1975*	
Phyllomedusidae	<i>Phyllomedusa bicolor</i>		X	X	Hoogmoed 1975*	X
Phyllomedusidae	<i>Phyllomedusa vaillantii</i>			X	Hoogmoed 1975*	
Hylidae	<i>Scinax ruber</i>		X			
Hylidae	<i>Scinax proboscideus</i>			X	Hoogmoed 1975*	
Hylidae	<i>Scinax boesemani</i>			X	Hoogmoed 1975*	
Hylidae	<i>Trachycephalus typhonius</i>		X			
Leptodactylidae	<i>Adenomera</i> sp.	X				
Leptodactylidae	<i>Adenomera andreae</i>	X	X			X
Leptodactylidae	<i>Adenomera heyeri</i>		X	X	Hoogmoed and Polder 1975*; Fouquet et al. 2011	X
Leptodactylidae	<i>Adenomera hylaedactylus</i>		X			
Leptodactylidae	<i>Leptodactylus knudseni</i>	X	X			
Leptodactylidae	<i>Leptodactylus leptodactyloides</i>	X				
Leptodactylidae	<i>Leptodactylus longirostris</i>	X	X			X
Leptodactylidae	<i>Leptodactylus mystaceus</i>	X	X	X	Hoogmoed and Polder 1975*	
Leptodactylidae	<i>Leptodactylus pentadactylus</i>	X	X	X	Hoogmoed 1975*	
Leptodactylidae	<i>Leptodactylus stenodema</i>			X	Hoogmoed and Myers 1975*	
Leptodactylidae	<i>Leptodactylus guianensis</i>		X	X	Hoogmoed 1975*	X
Leptodactylidae	<i>Leptodactylus rhodomystax</i>		X	X	Hoogmoed and Polder 1975*	X
Leptodactylidae	<i>Leptodactylus petersii</i>			X	Ouboter and Jairam 2012	
Strabomantidae	<i>Pristimantis</i> cf. <i>inguinalis</i>	X				
Strabomantidae	<i>Pristimantis inguinalis</i>			X	Ouboter and Jairam 2012	
Strabomantidae	<i>Pristimantis marmoratus</i>			X	Myers 1975	
Strabomantidae	<i>Pristimantis</i> sp1	X				
Strabomantidae	<i>Pristimantis</i> sp2	X				
Strabomantidae	<i>Pristimantis</i> sp3	X				
Strabomantidae	<i>Pristimantis</i> sp4	X	X			X
Strabomantidae	<i>Pristimantis zeuctotylus</i>	X	X	X	Hoogmoed 1974*	X

Herpetofauna of the Lely Mountains, Suriname

Table 1 (continued). Amphibian and reptile species reported for Mount Lely, Suriname. Data are included from three main sources: the Rapid Assessment Program (“RAP 2007”), the current survey conducted in June 2016 (“Current 2016”), and all others from literature surveys and online sources (“Other”). The latter include literature references, when available, and asterisks indicate the original collector(s), when known. For species only reported from one of these three sources, the table cells are color coded (yellow, green, or blue), which emphasizes the inherently “incomplete” nature of any individual survey. The last column (“Seq”) indicates whether sequences are available.

Higher taxa	Species	RAP 2007	Current 2016	Other	Original collector/literature citation	Seq
Amphibia: Anura						
Strabomantidae	<i>Pristimantis chiastonotus</i>			X	Hoogmoed 1974*	
Strabomantidae	<i>Pristimantis gutturalis</i>			X	Ouboter and Jairam 2012	
Microhylidae	<i>Chiasmocleis shudikarensis</i>	X	X			
Pipidae	<i>Pipa aspera</i>			X	G.F. Mees 1979*	
Amphibia: Gymnophiona						
Caecilidae	<i>Microcaecilia grandis</i>			X	Wilkinson et al. 2009	
Total amphibians	49 species	19	28	33		
Reptilia: Sauria						
Phyllodactylidae	<i>Thecadactylus rapicauda</i>		X			
Gekkonidae	<i>Lepidodactylus lugubris</i>		X			
Gekkonidae	<i>Hemidactylus mabouia</i>		X			
Sphaerodactylidae	<i>Gonatodes annularis</i>	X				
Sphaerodactylidae	<i>Gonatodes humeralis</i>	X	X	X	Hoogmoed 1974*	
Gymnophthalmidae	<i>Loxopholis guianense</i>	X	X	X	Hoogmoed 1974*	
Gymnophthalmidae	<i>Neusticurus bicarinatus</i>		X	X	Hoogmoed and Polder 1975*	
Gymnophthalmidae	<i>Neusticurus rudis</i>	X		X	Hoogmoed 1974*	
Gymnophthalmidae	<i>Arthrosaura reticulata</i>			X	Hoogmoed and Avila-Pires 1992	
Gymnophthalmidae	<i>Arthrosaura kocki</i>		X	X	Hoogmoed and Avila-Pires 1992	
Gymnophthalmidae	<i>Arthrosaura versteegi</i>			X	Hoogmoed and Avila-Pires 1992	
Dactyloidae	<i>Anolis chrysolepis</i>	X		X	Hoogmoed 1975*	
Dactyloidae	<i>Anolis punctatus</i>			X	Hoogmoed 1975*	
Polychrotidae	<i>Polychrus marmoratus</i>		X			
Scincidae	<i>Copeoglossum nigropunctatum</i>	X		X	Hoogmoed 1975*	
Gymnophthalmidae	<i>Iphisa elegans</i>			X	Hoogmoed 1975*	
Gymnophthalmidae	<i>Tretioscincus agilis</i>			X	Hoogmoed 1975*	
Sphaerodactylidae	<i>Chatogekko amazonicus</i>			X	Hoogmoed 1975*	
Teiidae	<i>Ameiva ameiva</i>	X	X	X	Hoogmoed 1975*	
Teiidae	<i>Kentropix calcarata</i>	X				
Teiidae	<i>Tupinambis teguixin</i>	X	X			
Tropiduridae	<i>Plica plica</i>	X		X	G.F. Mees 1979*	
Tropiduridae	<i>Plica umbra</i>		X	X	Hoogmoed 1975*	
Reptilia: Crocodylia						
Alligatoridae	<i>Paleosuchus trigonatus</i>	X	X			
Alligatoridae	<i>Caiman crocodilus</i>			X	Hoogmoed 1975*	
Reptilia: Serpentes						
Leptotyphlopidae	<i>Siagonodon cupinensis</i>			X	Hoogmoed 1977	
Leptotyphlopidae	<i>Epictia tenella</i>		X			

Table 1 (continued). Amphibian and reptile species reported for Mount Lely, Suriname. Data are included from three main sources: the Rapid Assessment Program (“RAP 2007”), the current survey conducted in June 2016 (“Current 2016”), and all others from literature surveys and online sources (“Other”). The latter include literature references, when available, and asterisks indicate the original collector(s), when known. For species only reported from one of these three sources, the table cells are color coded (yellow, green, or blue), which emphasizes the inherently “incomplete” nature of any individual survey. The last column (“Seq”) indicates whether sequences are available.

Higher taxa	Species	RAP 2007	Current 2016	Other	Original collector/literature citation	Seq
Reptilia: Serpentes						
Aniliidae	<i>Anilius scytale</i>			X	no data on collector	
Boidae	<i>Corallus caninus</i>			X	G.F. Mees 1979*	
Colubridae	<i>Atractus badius</i>			X	Hoogmoed 1975*	
Colubridae	<i>Dipsas catesbyi</i>	X				
Colubridae	<i>Dipsas indica</i>	X				
Colubridae	<i>Imantodes</i> sp.	X				
Colubridae	<i>Mastigodryas boddaerti</i>		X			
Colubridae	<i>Chironius carinatus</i>		X			
Colubridae	<i>Chironius fuscus</i>			X	G.F. Mees 1979*	
Colubridae	<i>Oxyrhopus formosus</i>	X				
Viperidae	<i>Bothrops atrox</i>	X	X			
Viperidae	<i>Bothrops brazili</i>			X	Lindeman 1975*	
Viperidae	<i>Bothrops bilineatus</i>	X				
Reptilia: Testudines						
Chelidae	<i>Platemys platycephala</i>	X	X	X	Hoogmoed 1975*	
Kinosternidae	<i>Kinosternon scorpioides</i>		X	X	Hoogmoed 1975*	
Total reptiles	42 species	18	18	25		

June 2016 survey. All specimens observed were found around the houses on water tanks and rain gauges at the airstrip. Although this species was observed and possibly collected by the members of the RAP, the specimens were misidentified as an undescribed *Pristimantis* species. For example, a misidentified specimen is depicted on the cover of the RAP report (Alonso and Mol 2007).

- *Osteocephalus oophagus* was heard calling while surveyors were walking at night in a patch of undisturbed forest south of the airfield in the Lely Mountains.
- *Scinax ruber* specimens were collected for the first time for the Lely Mountains. Specimens were observed on the large water holding tanks found around the houses on the airstrip.
- A specimen of *Chironius carinatus* was collected near one of the buildings at the airstrip on the tap of one of the water tanks.
- A specimen of *Trachycephalus typhonius* was collected during a night survey while surveyors were walking on a Suralco road. The collected individual was sitting on a leaf approximately 1.5 m above the

ground in a habitat of undisturbed forest.

- *Pristimantis* sp. 4 is noted for the first time for the Lely Mountains.
- *Thecadactylus rapicauda* was found on some of the buildings at the airstrip, apparently having moved to these locations from the surrounding forests.
- *Lepidodactylus lugubris* is an introduced SE Asian gecko (Hoogmoed and Avila-Pires 2015), and was most probably introduced into the Lely Mountains by the frequent flights which supply the small-scale gold miners and the airstrip personnel.
- *Hemidactylus mabouia* represents the first record for yet another introduced species in the Lely Mountains, and was frequently observed on the building where the surveyors stayed.
- *Polychrus marmoratus* was collected for the first time for this location, near the edge of the airstrip.
- Two specimens of *Epictia tenella* were collected in the morning around 8 AM, while the surveyors were walking around the edges of the airstrip. Both speci-

Herpetofauna of the Lely Mountains, Suriname

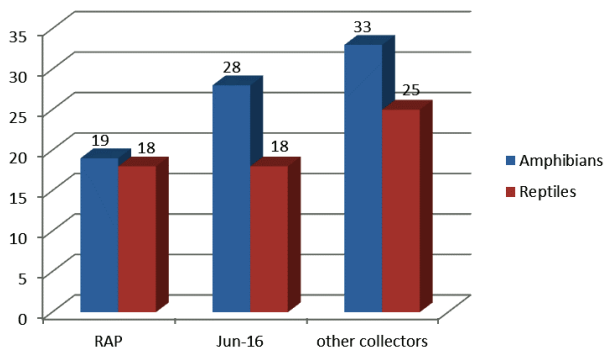


Fig. 2. Total number of species per group collected during each of the major surveys in the Lely Mountains, Suriname. “RAP” is the Rapid Assessment Program survey (Alonso and Mol 2007); “Jun-16” is the current survey; “Other collectors” includes all other available data.

mens were near the grassy edges of the airstrip and were active when observed.

- *Mastigodryas boddaerti* was observed whilst lifting a corrugated plate left behind in one of the abandoned small-scale miner camps.
- The pristine forests around the airstrip contained relatively large, water-filled depressions which were attractive to species such as *Chiasmocleis shudikarensis* and *Platemys platycephala*.
- Roads on the plateau with large water-filled potholes were an ideal habitat for *Phyllomedusa bicolor*, *Calimmedusa tomopterna*, *Pithecopus hypochondrialis*, and other Hylidae.



Fig. 3. (A) *Anomaloglossus stepheni*; (B) *Allobates femoralis*; (C) *Allobates granti*; (D) *Rhinella martyi*; (E) *Boana xerophylla*; and (F) *Scinax ruber*.



Fig. 4. (A) *Trachycephalus typhonius*; (B) *Leptodactylus knudseni* (juv.); (C) *Leptodactylus pentadactylus* (juv.); (D) *Leptodactylus mystaceus*; (E) *Leptodactylus rhodomystax* (juv.); and (F) *Ameerega trivittata*.

Discussion

Some problems were encountered with two of the species collected during the RAP, namely *Anomaloglossus beebei* and *Anomaloglossus degranvillei*. The authors of the RAP survey confused *A. beebei* with *Allobates granti*, which occurs in the Lely Mountains whilst the former is only found at Kaieteur National Park, Guyana (Kok et al. 2006). The *Anomaloglossus degranvillei* reportedly collected during the RAP might have been confused with *A. stephensi* or *A. surinamensis*. A study by Fouquet et al. (2018) has shown that *A. degranvillei* is restricted to a small area in French Guiana and also proved that *A. surinamensis* probably occurs in the Lely Mountains. Specimens of *A. stephensi* were collected during the 2016 survey. *Anomaloglossus surinamensis* was first described

by Ouboter and Jairam (2012) who had previously also identified specimens from the nearby Nassau Mountains as *A. degranvillei* (Ouboter et al. 2007).

Some of the *Pristimantis* species documented during the RAP still remain to be identified, so chances are that their eventual identification might change the number of amphibian species for the Lely Mountains. Since the 2016 survey was held in a period with very little rainfall, very few frogs were calling. Therefore, we believe that additional surveys during the rainy season would be interesting and would definitely increase the number of known amphibians for this location.

The increasing human presence in the Lely Mountains might have resulted in an extension of the distribution ranges for *Boana sclerophylla*, *Scinax ruber*, *Trachycephalus typhonius*, *Lepidodactylus lugubris*, and



Fig. 5. (A) *Leptodactylus longirostris*; (B) *Boana boans*; (C) *Callimedusa tomopterna*; (D) *Phyllomedusa bicolor*; and (E) *Pithecopus hypochondrialis*. Photos by D. Baeta.

Hemidactylus mabouia; species that were not recorded during the earlier surveys. Although most of the days spent on the Lely Mountains were quite dry not many reptile species were collected. Snakes, for example, were the least represented group, and just four specimens belonging to three species were found. Small-scale gold miners were very active in the Lely Mountains, a factor which might have contributed to the disturbance in the forest and the only creek that was found and sampled. The number of species added to the list published during the RAP and the prospects for organizing another survey to this location validate the value of this checklist. We would strongly recommend that the Lely Mountains be spared from further destruction by illegal mining activities, and additional surveys involving other groups should be conducted to establish a satisfactory list

of species present and to save this Mountain from the complete destruction of its habitats.

Conclusions

The compiled results presented herein show that the amphibian and reptile communities on the Lely Mountains are much more diverse than previously reported. Though five separate surveys have been conducted at this locality, chances are that the known species diversity will continue to increase as different areas on the plateau are surveyed. The presence of illegal small-scale gold miners on the plateau has resulted in the rapid conversion of forested areas into unsuitable habitats which may translate into a loss of species diversity.

Acknowledgements.—I would like to thank the Nature Conservation Department that kindly provided the permits which allowed the fieldwork in the Lely Mountains. D. Baéta and T. Gazoni were valuable companions in the field, and contributed significantly to the number of species documented during the survey in June 2016. A first draft of this article was reviewed by A. Fouquet whose comments greatly improved the manuscript.



Fig. 6. (A) *Adenomera heyeri*; (B) *Dendropsophus leucophyllatus*; (C) *Chiasmocleis shudikarensis*; and (D) *Pristimantis* sp. 4.

Literature Cited

- Alonso LE, Mol JH (Editors). 2007. *A Rapid Biological Assessment of the Lely and Nassau Plateaus, Suriname (with Additional Information on the Brownsberg Plateau)*. RAP Bulletin of Biological Assessment 43. Conservation International, Center for Applied Biodiversity Science (CABS), Arlington, Virginia, USA. 276 p.
- Avila-Pires TCS. 1995. Lizards of Brazilian Amazonia (Reptilia: Squamata). *Zoologische Verhandelingen* 299: 1–706.
- Bauer AM, Jackman TR, Greenbaum E, Papenfuss TJ. 2007. First record of *Lepidodactylus lugubris* in Suriname. *Applied Herpetology* 4(1): 84.
- Fouquet A, Gaucher P, Blanc M, Velez-Rodriguez CM. 2007. Description of two new species of *Rhinella* (Anura: Bufonidae) from the lowlands of the Guiana Shield. *Zootaxa* 1663: 17–32.
- Fouquet A, Vacher J-P, Kadosoe V, Ouboter P, Jairam R. 2015. Checklist of the amphibians of the Sipaliwini area, Suriname. *Herpetology Notes* 8: 63–68.
- Fouquet A, Noonan BP, Blanc M, Orrico VGD. 2011. Phylogenetic position of *Dendropsophus gaucheri* (Lescure and Marty 2000) highlights the need for an in-depth investigation of the phylogenetic relationships of *Dendropsophus* (Anura: Hylidae). *Zootaxa* 3035: 59–67.
- Fouquet A, Orrico VGD, Ernst R, Blanc M, Martinez Q, Vacher JP, Rodrigues MT, Ouboter P, Jairam R, Ron S. 2015. A new *Dendropsophus* Fitzinger, 1843 (Anura: Hylidae) of the *parviceps* group from the lowlands of the Guiana Shield. *Zootaxa* 4052(1): 39–64.
- Hoogmoed MS. 1973. *Notes on the Herpetofauna of Surinam IV: The Lizards and Amphisbaenians of Surinam*. Biogeographica 4. W. Junk Publishers, The Hague, Netherlands. 419 p.
- Hoogmoed MS, Avila-Pires TCS. 2015. *Lepidodactylus lugubris* (Duméril and Bibron 1836) (Reptilia: Gekkonidae), an introduced lizard new for Brazil, with remarks on and correction of its distribution in the New World. *Zootaxa* 4000(1): 90–110.
- Jairam R, Jairam-Doerga S. 2016. Range extension and some morphological characteristics of *Ptychoglossus brevifrontalis* Boulenger, 1912 (Squamata: Alopoglossidae) in Suriname. *Amphibian & Reptile Conservation* 10(2) [General Section]: 30–33 (e127).
- Jairam R, Jairam-Doerga S. 2015. First record of *Amapasaurus tetradactylus* Cunha, 1970 (Squamata: Gymnophthalmidae) in Suriname. *Check List* 11: 1–4.
- Jairam R, d'Orgeix CA, d'Orgeix CH, Harris A. 2016. Range extension and distribution of the invasive Moreau's Tropical House Gecko, *Hemidactylus mabouia* (Moreau de Jonnès, 1818) (Squamata: Gekkonidae), in Suriname. *Check List* 12(5): 1–5.
- Kok PJR, Sambhu H, Roopsind I, Lenglet GL, Bourne GR. 2006. A new species of *Colostethus* (Anura: Dendrobatidae) with maternal care from Kaieteur



Fig. 7. (A) *Arthrosaura kocki*; (B) *Loxopholis guianense*; (C) *Neusticurus bicarinatus*; (D) *Polychrus marmoratus*; and (E) *Plica umbra*.

National Park, Guyana. *Zootaxa* 1238: 35–61.
 Mol JH, Wan Tong You K, Vrede I, Flynn A, Ouboter P, van der Lugt F. 2007. Fishes of Lely and Nassau Mountains, Suriname. Pp. 107–118 In: *A Rapid Assessment of the Lely and Nassau Plateaus, Suriname (with Additional Information on the Brownsberg Plateau)*. RAP Bulletin of Biological Assessment 43. Editors, Alonso LE, Mol JH. Conservation International, Center for Applied Biodiversity Science (CABS), Arlington, Virginia, USA. 276 p.
 Nielsen S, Jairam R, Ouboter P, Noonan B. 2013. A

herpetofaunal survey of the Grensgebergte and Kasikasima regions, Suriname. Pp. 131–144 In: *A Rapid Biological Assessment of the Upper Palmeu Watershed (Grensgebergte and Kasikasima) of Southeastern Suriname*. RAP Bulletin of Biological Assessment 67. Editors, Alonso LE, Larsen TH. Conservation International, Arlington, Virginia, USA. 176 p.
 Noonan BP, Gaucher P. 2005. Phylogeography and demography of Guianan harlequin toads (*Atelopus*): diversification within a refuge. *Molecular Ecology*



Fig. 8. (A) *Chironius fuscus*; and (B) *Epictia tenella*.

14(10): 3,017–3,031.
 Ouboter P. 2017. Amphibians and reptiles. Pp. 256–303 In: *Natural History and Ecology of Suriname*. Editor, de Dijn B. LM Publishers, Volendam, Netherlands. 480 p.
 Ouboter PE, Jairam R, Kasanpawiro C. 2011. A rapid assessment of the amphibians and reptiles of the Kwamalasamutu region (Kutari/lower Sipaliwini Rivers), Suriname. Pp. 124–130 In: *A Rapid Biological Assessment of the Kwamalasamutu Region, Southwestern Suriname*. RAP Bulletin of Biological Assessment 63. Editors, O’Shea BJ, Alonso LE, Larsen TH. Conservation International, Arlington, Virginia, USA. 156 p.
 Ouboter PE, Jairam R. 2012. *Amphibians of Suriname*. Brill Academic, Leiden, Netherlands. 376 p.
 Ouboter PE, Jairam R, Wan Tong You K. 2007. Additional records of amphibians from Nassau Mountains, Suriname. Pp. 126–129 In: *A Rapid Assessment of the Lely and Nassau Plateaus, Suriname (with Additional Information on the Brownsberg Plateau)*. RAP Bulletin of Biological Assessment 43. Editors, Alonso LE, Mol JH. Conservation International, Center for Applied Biodiversity Science (CABS), Arlington, Virginia, USA. 276 p.

Applied Biodiversity Science (CABS), Arlington, Virginia, USA. 276 p.
 Powell R, Crombie RI, Boos HE. 1998. *Hemidactylus mabouia*. *Catalogue of American Amphibians and Reptiles* 674: 1–11.
 Vacher JP, Kok PJ, Rodrigues MT, Lima JD, Lorenzini A, Martinez Q, Fallet M, Courtois EA, Blanc M, Gaucher P, et al. 2017. Cryptic diversity in Amazonian frogs: integrative taxonomy of the genus *Anomaloglossus* (Amphibia: Anura: Aromobatidae) reveals a unique case of diversification within the Guiana Shield. *Molecular Phylogenetics and Evolution* 112: 158–173.
 Watling JI, Ngadino LF. 2007. A preliminary survey of amphibians and reptiles on Nassau and Lely Mountains, eastern Suriname. Pp. 119–125 In: *A Rapid Biological Assessment of the Lely and Nassau Plateaus, Suriname (with Additional Information on the Brownsberg Plateau)*. RAP Bulletin of Biological Assessment 43. Editors, Alonso LE, Mol JH. Conservation International, Center for Applied Biodiversity Science (CABS), Arlington, Virginia, USA. 276 p.



Fig. 9. Overview of the airstrip in the Lely Mountains with parts of the forest visible where the June 2016 surveys were conducted. Photo by T. Gazoni.



Rawien Jairam is an associate researcher working at the National Zoological Collection of Suriname. Rawien has an M.Sc. in conservation biology and has been interested in the herpetofauna of Suriname for many years. In addition to herpetology in general, he is specifically interested in taxonomy, species descriptions, and distribution.