Checklist of the lizards of Togo (West Africa), with comments on systematics, distribution, ecology, and conservation

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ABSTRACT
The lizard fauna of Togo, a country situated within a natural gap in the rainforest zone of West Africa, is reviewed and updated. In this article, we summarize all available data on the distribution, ecology, and conservation status of the 43 lizard species of Togo. Species richness is uneven between vegetation zones. The submontane forest (ecological zone IV), despite being the smallest, houses the greatest number of species (n = 27), followed by dry forest (ecological zone II, n = 21). Currently none of the Togolese lizard species appears to be immediately threatened. However, several species are subjected to exploitation for the international pet trade and in-country use (bush-meat, fetish market), and could become threatened in the next decades. The intensity of this trade should be carefully monitored in the years to come.

KEY WORDS
Sauria,
Togo,
distribution,
ecology,
conservation.

RÉSUMÉ
Liste commentée des lézards du Togo (Afrique de l'ouest) avec des remarques sur la systématique, la distribution, l'écologie et la conservation des espèces.
La faune de lézards du Togo, un pays situé dans la zone d'interruption de la forêt tropicale d'Afrique de l'Ouest, est revue et mise à jour. Dans cet article, nous résumons toutes les données disponibles sur la distribution, l'écologie et la conservation des 43 espèces de lézards du Togo. La richesse spécifique est inégale entre les zones de végétation. La zone de forêt sub-montagnarde (zone écologique IV), bien qu'étant la plus petite, abrite le plus grand nombre d'espèces (n = 27), suivie par la forêt sèche (zone écologique II, n = 21). Actuellement, aucune des espèces de lézards togolais ne semble être immédiatement menacée. Cependant, plusieurs espèces sont exploitées pour le commerce international des animaux de compagnie et pour des usages locaux (viande, marchés aux fétiches) et pourraient devenir menacées dans les prochaines décennies. L'importance de ce commerce devrait être soigneusement encadrée dans les années à venir.

MOTS CLÉS
Sauria,
Togo,
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écologie,
conservation.

INTRODUCTION

In 1893, Matschie published a list of 16 lizard species from Togo, including the parts of Ghana which belonged to German-Togo at that time. Tornier (1901) subsequently listed 28 lizard species, including two new species: *Chalcides thierryi* Tornier, 1901, *Hemidactylus matschiei* (Tornier, 1901), and two subspecies: *Gerrhosaurus major zechi* Tornier, 1901, and *Ptyodactylus hasselquistii togoensis* Tornier, 1901. The subspecific status of the latter two taxa has been disputed (Heimes 1987). Werner (1902) published a list of nine lizard species from Togo, and also described a novel species (i.e. *Panaspis togoensis* (Werner, 1902)). Apart from these three papers, the lizard fauna of Togo received only little attention during the last 100 years. Loveridge (1947) mentioned the occurrence of a few gecko species from Togo, but this study was essentially bibliographic and widely based on the work of Tornier (1901) and Werner (1902). Hoogmoed (1974) mentioned the occurrence of some skink species in Togo, but his study was likewise mostly based on the same two formerly cited articles. In 2006 some research was carried out in the Togo Hills in neighboring Ghana (Leaché *et al.* 2006). In the "Monographie nationale sur la diversité biologique" (PNAE 2002) the occurrence of 30 lizard species was reported, however, it included several taxonomic errors. Recently, Mediannikov *et al.* (2012) published a review of the genus *Agama* Daudin, 1802 in West Africa with the description of *Agama parafricana* Trape, Mediannikov & Trape, 2012 from Asrama forest in the South-East of Togo. In the same year, Trape *et al.* (2012) published the first comprehensive monograph of lizards, crocodiles and chelonians of West Africa and the Sahara, including a remarkable amount of locality data from Togo.

Reasons for updating the checklist of Togolese lizard species are: 1) new species have been recently described from Togo (Wagner *et al.* 2014) and the systematic status of several taxa is fluid (e.g., Wagner *et al.* 2009); and 2) several lizard species are currently harvested at significant levels for the international pet trade, with Togo being one of the main reptile exporters of sub-Saharan Africa (Affre *et al.* 2005). Moreover, the natural habitats of these animals have been heavily degraded, converted or destroyed (PNAE 2002; Adjossou 2009), thus potentially resulting in declining lizard populations. In order to help protect and manage Togo's herpetofauna, some faunistic studies have been recently published (Segniagbeto *et al.* 2007, 2011, 2013a, b, 2014; Segniagbeto 2009; Hillers *et al.* 2009). Lizards, however, have been largely neglected.

This paper, therefore, presents an updated list of the lizard species occurring in Togo, based on an extensive examination of European museum vouchers, literature data and the authors' own field surveys. For each species, data on their ecology, habitat, and distribution are included if pertinent with Togolese ecological zones and/or with analogous habitats in other West African regions, and, when needed, taxonomy is commented on.

MATERIALS AND METHODS

Study area

Togo is a West African country bordering the Gulf of Guinea (Fig. 1). It is a long strip (660 km from North to South) of land located between 6°-11°N latitude and 0°-2°E longitude. Along the coast it is 50 km wide and its maximal width is 120 km between 7° and 8°N. The landscape largely consists of a gently undulating plain, with the exception of the "chaîne de l'Atakora" in the North of the country. The Togolese landscape comprises, from South to North, a succession of various ecosystems ranging from coastal grasslands to equatorial and wet tropical forests and ending in Sudanese savannahs in the North. According to Ern (1979), the vegetation of Togo can be divided into five ecological zones (Fig. 1; Table 1): ecological zone I consists of Sudanese savannahs with dominant leguminous plants of the family Mimosoideae DC. (1825) (*Acacia* spp.) or Combretaceae R.Br., 1810 (*Terminalia* spp., *Combretum* spp.), dry forests dominated by *Anogeissus* spp., gallery forests, and grasslands. Ecological zone II is made up of hills covered in part with dense dry forests and open forests. Ecological zone III is the area of the Guinean savannah. It is characterized by a relatively rich flora in which Combretaceae and Andropogoneae Dumort. (1824) dominate. Ecological zone IV corresponds to the southern part of the country. It is characterized by a wet tropical climate and was originally largely covered with true tropical wet forests or semi-deciduous forests. The remaining tropical forests of Togo are entirely situated inside ecological zone IV. Ecological zone V is restricted to the littoral area. It consists of a highly disturbed landscape of littoral bushes, marshy grasslands and mangroves (Fig. 1; Table 1).

Field data

Lizard specimens were collected in the different ecological regions of Togo (Fig. 1; Table 1), by means of random surveys in appropriate habitats with the help of local guides and hunters. Surveys were carried out during both day- and night-time. Vouchers of species which may be difficult to identify unambiguously were collected, sacrificed and preserved in 4% formalin or 75% ethanol and stored at the Muséum national d'histoire naturelle, Paris (MNHN), the Museum für Naturkunde, Berlin (ZMB), and in the research collection of G. H. Segniagbeto at the University of Lomé (coll. GHS-W and coll. GHS-Togo). Tissue samples (muscle) were removed and separately stored in 96% ethanol.

Collected specimens were examined in the laboratory and compared to vouchers deposited at MNHN and ZMB. The identification was predominately based on Trape *et al.* (2012), and some further, taxon specific papers. For Scincidae Opell, 1811, the works of Hoogmoed (1974), Greer *et al.* (1985), Rödel *et al.* (1997) and Schmitz *et al.* (2005) were considered. The definition of characters and the nomenclature of scales in this group were based on the works of Avila-Pires (1995) and Miralles (2006). The identification of the Lacertidae Gray, 1825 was based upon Günther (1872) and Boulenger (1920). Tornier (1901) and Loveridge (1942) were used for the Gerrhosauridae Fitzinger, 1843, including some characters

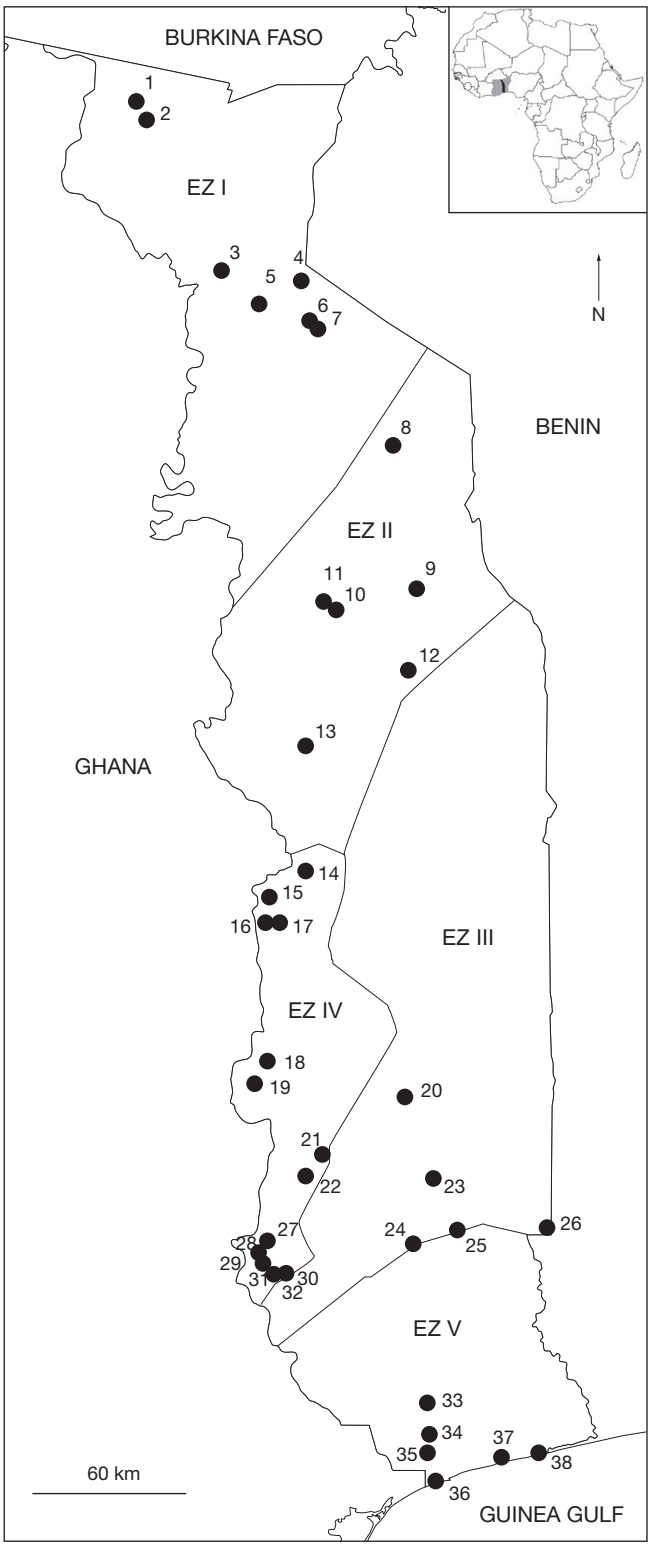

Fig. 1. — Map of Togo, showing the main vegetation zones and the sites of Lizards records. Symbols: **EZ**, Ecological Zone; **1**, Nanergou; **2**, Dapaong; **3**, Mango; **4**, Gando; **5**, Sabiégou; **6**, N'Gambi; **7**, Naboulgou; **8**, Niamtougou; **9**, Alédjo; **10**, Bassar; **11**, Binaparba; **12**, Sokodé; **13**, Fazao; **14**, Oga; **15**, Yégué; **16**, Diguengue; **17**, Assoukoko; **18**, Badou; **19**, Akloa; **20**, Atakpame; **21**, Sodo; **22**, Agoté; **23**, Huilehoe; **24**, Notsé; **25**, Asrama; **26**, Tohoun; **27**, Kpime; **28**, Missahohé; **29**, Agome Yo; **30**, Kpalime; **31**, Agou; **32**, Kebo-Dzigbe; **33**, Tsévié; **34**, Tgblekope; **35**, Agoé; **36**, Lomé; **37**, Togoville, **38**, Aného.

TABLE 1. — List of collecting localities.

Localities	Ecological Zone	Latitude	Longitude
Agoé	V	06°11'60.00"N	01°13'01.20"E
Agome Yo	IV	06°56'38.00"N	00°35'50.10"E
Agoté	IV	07°15'16.80"N	00°47'48.80"E
Agou	IV	06°50'60.00"N	00°43'01.20"E
Akloa	IV	07°30'26.78"N	00°35'57.31"E
Alédjo	II	09°15'00.00"N	01°11'60.00"E
Aneho	V	06°13'44.30"N	01°36'22.80"E
Asrama	III	07°00'01.71"N	01°24'27.04"E
Assoukoko	IV	08°00'36.07"N	00°41'15.54"E
Atakpamé	IV	07°31'27.24"N	01°07'29.05"E
Badou	IV	07°34'60.00"N	00°36'00.00"E
Bassar	II	09°40'58.80"N	00°28'58.80"E
Binaparba	II	09°13'58.80"N	00°46'01.20"E
Dapaong	I	10°51'07.56"N	00°12'28.51"E
Diguengué	IV	08°04'59.99"N	00°37'59.99"E
Fazao	II	08°40'35.72"N	00°32'13.04"E
Gando	I	10°19'32.30"N	00°44'54.99"E
Huiléhoé	III	06°59'26.02"N	01°17'54.19"E
Kebo-Dzigbe	IV	06°52'05.40"N	00°45'05.48"E
Kpalimé	IV	06°54'08.16"N	00°37'57.23"E
Kpimé	IV	06°59'34.80"N	00°39'16.20"E
Lomé	V	06°07'35.70"N	01°13'40.22"E
Mango	I	10°21'33.00"N	00°28'15.00"E
Misa-Höhe	IV	06°56'60.00"N	00°34'58.80"E
N'Gambi	I	10°12'29.30"N	00°47'19.20"E
Naboulgou	I	10°09'28.50"N	00°49'45.70"E
Nanergou	I	10°54'15.44"N	00°08'54.81"E
Niamtougou	I	09°45'54.43"N	01°06'50.62"E
Notsé	III	06°56'31.38"N	01°10'17.33"E
Oga	IV	07°36'15.14"N	00°49'20.96"E
Payo	I	10°13'50.70"N	00°41'56.90"E
Sabiegou	I	10°14'43.90"N	00°38'38.80"E
Sodo	IV	07°18'50.80"N	00°48'45.80"E
Sokodé	III	08°59'02.43"N	01°08'58.12"E
Togblékopé	V	06°15'40.52"N	01°13'08.67"E
Togoville	V	06°13'43.59"N	01°28'24.93"E
Tohoun	III	07°01'04.84"N	01°36'48.70"E
Tsévié	V	06°25'11.18"N	01°12'39.49"E
Yégué	IV	08°10'58.80"N	00°38'60.00"E

considered by Spawls *et al.* (2004). The works of Loveridge (1947) and Bauer *et al.* (2006) provided the characters for the identification of the Gekkonidae Gray, 1825. For the Agamidae Linnaeus, 1758, we referred to Mediannikov *et al.* (2012) and the newest data presented by Trape *et al.* (2012). Ullenbruch *et al.* (2007) and Tilbury (2010) were considered for the Chamaeleonidae Rafinesque, 1815, and Böhme & Ziegler (1997) and Bayless (2002) for the Varanidae Gray, 1827. The identification of the Amphisbaenidae Gray, 1865 was based on Loveridge (1941), Dunger (1968), Gans (1987), Kearney (2003), and Rödel & Grabow (1996). In addition, we consulted for all species characters mentioned in Spawls *et al.* (2004) and Chirio & LeBreton (2007). All photographs were taken by Gabriel Hoinsoude Segniagbeto.

Data analyses

Dendrogram analysis for clustering the various species by similarity of ecoregions composition at the species level was performed by using data of presence/absence of each species in the various above-mentioned ecological zones, utilizing the Ward method as algorithm and Euclidean distance as the similarity measure. In our case, clusters are joined such that increase in within-group variance is minimized, thus clarifying the observed patterns. Group selection was based on 40 bootstraps as branching measurements. The percentage of replicates where each node was still supported was given on the dendrogram. Dendrogram analysis was performed with PAST statistical software (Bow 1984; Hammer 2012).

Abbreviations

Coll. GHS-W / coll. GHS-Togo — Collections of Gabriel Hoinsoude Segniagbeto; deposited at the University of Lomé (Togo);
Coll. JFT — Collection of Jean-François Trape, deposited at the Institut de Recherche pour le Développement (IRD) Dakar (Senegal);
IRD –T — Collection of Institut de Recherche pour le Développement at Dakar;
MNHN — Muséum national d'Histoire naturelle, Paris;
RMCA — Royal Museum for Central Africa, Tervuren, Belgium;
ZMB — Zoologisches Museum, Berlin, Germany;

CHECKLIST OF LIZARD SPECIES RECORDED FROM TOGO

Family SCINCIDAE Opell, 1811
Genus *Trachylepis* Fitzinger, 1843

Trachylepis affinis (Gray, 1838)
(Fig. 2)

Tiliqua affinis Gray, 1838: 289.

MATERIAL EXAMINED. — 50 specimens: **Togo**. Agoté, coll. GHS-W 0888 and 0889, coll. JFT 1699; Akloa, coll. GHS-W 0621, coll. JFT 1699; Alédjo, coll. JFT 2312; Diguengué, coll. JFT 2340; Fazao, coll. GHS-W 0623, 0844, 0843, 0845, 0848, 0841 and 0842; Kebo-Dzigbe (Monts Agou), ZMB 77937-77947, RMCA A7.036.R-0059-0065; Kéran (Parc national de la Kéran), coll. JFT 2305, 2307; Misa-Höhe, coll. JFT 1705, 1709, 1722; Oga, coll. GHS-W 1127.
Guinea. No precise locality, MNHN 1943.44-47.
Ivory Coast. No precise locality, MNHN 1967.234-239 and 1967.307-310.

HABITATS AND DISTRIBUTION. — This is a typical forest species, including forest clearings and dry forests as well as semi-deciduous forests in ecological zones I, II, III and IV. It is a diurnal species, that hides under the leaf litter. This species is abundant in the Agou and Togo mountains. The northernmost distribution area of this species is the Parc national de la Kéran and Oti-mandouri, but it occurs also in Burkina Faso, Mali and Niger according to Böhme *et al.* (1996) and Trape *et al.* (2012). Its presence in the North-western regions (forêt de Djamdè, forêt de Galangashi) has been confirmed during the present study. This species was first cited for Togo by Matschie (1891) from Bismarkburg (now Yégué); Hoogmoed (1974) and Leaché *et al.* (2006) also mentioned its presence in the forested regions of surrounding areas of Ghana.

Notes

The taxonomic status of this species is yet not clear; indeed, the synonymies of *Euprepis blandingii* Hallowell, 1844 and *Euprepis raddonii* Gray, 1845 with *Tiliqua affinis* Gray, 1839, which were proposed by Hoogmoed (1974), are still in doubt

FIG. 2. — *Trachylepis affinis* (Gray, 1838).

according to Leaché *et al.* (2006). Further studies are needed to resolve this problem.

Trachylepis albilabris (Hallowell, 1857)

Euprepes albilabris Hallowell, 1857: 51.

MATERIAL EXAMINED. — 24 specimens: **Togo**. Kebo-Dzigbe, ZMB 77948-77952, RMCA A7.036.R.0042-0052.
Guinea. MNHN 1943.41, 1951.0090, 1951.0095, 1951.0099, 1951.0155, 1967.225, 1967.245 and 1967.248.

HABITATS AND DISTRIBUTION. — Five specimens from Kebo-Dzigbe (Agou Mountains) were collected and deposited in ZMB during his study. This is the first record of this species for Togo. In Togo, it seems confined to the mountain forests of ecological zone II. Its presence in Badou and Adélé, which are mountain forest areas close to the Ghana border, is probable.

Trachylepis buettneri (Matschie, 1893)

Mabuya büttneri Matschie, 1893: 170.

MATERIAL EXAMINED. — 2 specimens: **Togo**. No precise locality, ZMB 15231 and 15179.

HABITATS AND DISTRIBUTION. — This species has been described from Togo by Matschie (1893), and then recorded by Tornier (1901) and PNAE (2002). *Trachylepis buettneri* is a species known from humid Guinean savannah (Barbault 1971; Rödel *et al.* 1997), with a distribution probably limited in Togo to ecological zones II and IV.

Trachylepis maculilabris (Gray, 1845) (Fig. 3)

Euprepis maculilabris Gray, 1845: 114.

MATERIAL EXAMINED. — 58 specimens: **Togo**. Diguengue, coll. JFT 2338-2339; Kara, coll. JFT 2229-2234; Kebo-Dzigbe (Monts Agou), ZMB 77953-77963, RMCA A7.036.R.0053-0058; Misa-Höhe, ZMB 16066, coll. JFT 1701, 1703, 1704, 1706, 1707 and 1728; Sodo, coll. JFT 1701; no precise locality, ZMB: 16602 (2 specimens), ZMB 11257 (7 specimens), ZMB 16280, 16279, 16333.
Ghana. Kété-Kratchi, ZMB 17373 (5 specimens) and ZMB 17372 (4 specimens).
Guinea. No precise locality, MNHN 1951.0101-0108, 1951.0157-0160, 1967.247 and 1994.1211.

HABITATS AND DISTRIBUTION. — This is a widespread species in Togo, with a northern limit situated around Kara (Ecological zone II). It inhabits forests, bushlands and human settlements. It was first recorded in Togo by Matschie (1893), and later cited by Tornier (1901), Hoogmoed (1974) and Leaché *et al.* (2006) for nearby areas of Ghana.

FIG. 3. — *Trachylepis maculilabris* (Gray, 1845).

NOTES
Considering the temporal formula, the head scale shapes, the coloration and the general appearance of the animal, there are, across the whole distribution of the species, two recognizable forms of *T. maculilabris*. The first form is characterized by two primary temporal scales (the inferior one being the largest), and three secondary temporals (the highest being the largest), without distinct tertiary temporals. The second form has one primary, two secondary, and three distinct tertiary temporals. These two forms are here considered as an expression of the intraspecific variability of this species, but further taxonomic research on this species is certainly warranted.

Trachylepis perrotetii (Duméril & Bibron, 1839)

Euprepes perrotetii Duméril & Bibron, 1839: 669.

MATERIAL EXAMINED. — 32 specimens: **Togo**. Agoé, MNHN 2006.2230-2231 and 2006.2216-2217; Fazao, coll. JFT 2196; Huiléhoé, coll. JFT 2173, N'Gambi in National Park of Kéran, MNHN 2006.2232-2233; no precise locality, ZMB 16094, 16287, 16097, 16095, 16093, 16099, 11252 and 16277.
Benin. MNHN 1986.758-764 and 1986.775-776.; Ghana: Kété-Kratchi ZMB 16098;

HABITATS AND DISTRIBUTION. — *Trachylepis perrotetii* is widespread in Togo, and has been recorded from all the five ecological zones of the country. It colonizes many habitats, and is especially common in open areas. It was first cited to occur in Togo by Matschie (1893).

NOTES
This species occurs with two forms, one of them being much more robust and of greater size than the other. We considered these two forms as intraspecific variation, showing variation in the absence of the pair of transversal nuchals, but further research may be needed in this regard.

Trachylepis polytropis (Boulenger, 1903)

Mabuia polytropis Boulenger, 1903: 433.

MATERIAL EXAMINED. — 5 specimens: **Togo**. Kebo-Dzigbe (Monts Agou), MRAC A7-036-R-0041; coll. JFT 2510, coll. GHS-W 1887-1889.
Cameroon. Bipindi ZMB 21236a, 21236b.

HABITATS AND DISTRIBUTION. — The specimens are the first recorded for Togo. They have been collected in the Agou Mountain forest. The presence of this species in other sites within the forested area of Togo, specifically around Badou and Assoukoko, along the Ghana border, seems possible.

NOTES
We assigned the individuals from Agou Mountain to *Trachylepis polytropis* (Boulenger, 1903) in spite of the fact that a similar species was described in Ghana (*Trachylepis paucisquamis* (Hoogmoed, 1978). The specimens of Agou Mountain are very robust and with coloration being characterized by the presence of the transversal black band on the dorsal. Hoogmoed's species, *Trachylepis paucisquamis* (Hoogmoed, 1978) is more slender and apparently occurs in more western

FIG. 4. — *Lepidothyris fernandi* (Burton, 1836).

regions in Africa (western Ghana, Ivory Coast, Liberia) than does *T. polytropis* (see Hoogmoed 1978).

Trachylepis quinquetaeniata (Lichtenstein, 1823)

Scincus quinquetaeniatus Lichtenstein, 1823: 103.

MATERIAL EXAMINED. — 19 specimens: **Togo**. Agoé, coll. GHS-W 0231-0232, 0236-0237, 0281 and 0283; Dapaong, coll. JFT 2299; Huiléhoé, coll. JFT 2172; Mango, ZMB 16604 (2 specimens); Togblékopé, MNHN 2006.2234-2241; no precise locality, ZMB 16286.

HABITATS AND DISTRIBUTION. — This species is spread across all the five ecological zones of Togo. It is also relatively common in urban areas, e.g., in Lomé (Segniagbeto, unpublished observations). It was first cited to occur in Togo by Tornier (1901) for Mango, and for Atakpamé by Werner (1902). 860 specimens were exported from Togo in the years 2000-2005 according to the CITES Division of the Direction de la Faune et de Chasse of the Ministère de l'Environnement et des Ressources forestières.

Genus *Cophoscincopus* Mertens, 1934

Cophoscincopus simulans (Vaillant, 1884)

Cophoscincus simulans Vaillant, 1884: 170.

MATERIAL EXAMINED. — 15 specimens: **Togo**. Misa-Höhe, ZMB 11251 (3 specimens), 16061; coll. GHS-W 0622 and 0624. **Guinea**. no precise locality, MNHN 1951.116, 1951.121, 1967.182 and 1967.186-189.

HABITATS AND DISTRIBUTION. — *Cophoscincopus simulans* is a species typically living along and in small forest creeks (Böhme *et al.* 2000, 2011; Rödel & Branch 2003). It is a diurnal lizard, that was collected repeatedly by us in the forêt de Misa-Höhe. Tornier (1901) also recorded specimens from the same region: Misa-Höhe and Bismarckburg (now Yégué in Adélé). Leaché *et al.* (2006) found this species in the forest zone of Togo Hills in Ghana.

Genus *Lepidothyris* Cope, 1892

Lepidothyris fernandi (Burton, 1836) (Fig. 4)

Tiliqua fernandi Burton, 1836: 62.

MATERIAL EXAMINED. — 14 specimens: **Togo**. Badou, MNHN 2006.2243, ZMB 77925-77929; Notsé, MNHN 2006.2242; Badou, ZMB 77925-77929.
Bénin. No precise locality, MNHN 1986.768-769.

HABITATS, NATURAL HISTORY AND DISTRIBUTION. — *Lepidothyris fernandi* is essentially a forest species, although in Nigeria it may also be found in plantations at the border of the main forest (Akani *et al.* 2009). This species is usually active in the evening, and most of the specimens spend the whole day inside their burrows (Akani *et al.* 2009). Isopoda and Coleoptera dominated in the dietary samples of Nigerian specimens, but also other lizards were frequently eaten (at least in swamp forest habitat during the wet season; Eniang *et al.* 2014b). This species is here recorded for the first time from Togo, although many individuals (for instance, up to 1540 specimens between 2001 and 2005) are regularly exported every year for the pet trade. The genus attribution of this species follows Wagner *et al.* (2009).

FIG. 5. — *Panaspis togoensis* (Werner, 1902).

Genus *Mochlus* Günther, 1864

Mochlus guineensis (Peters, 1879)

Euprepes (*Tiliqua*) *guineensis* Peters, 1879: 773.

MATERIAL EXAMINED. — 17 specimens: **Togo**. Agoté, coll. JFT 1700; Alédjo, coll. JFT 2310; Binaparba, RMCA 73.009.R.178 and 73.009.R.179; Fazao, coll. JFT 2175-2177, 2216; Huiléhoé, coll. JFT 2328; Kebo-Dzigbe (Monts Agou), GSHS-W 1881-1885, Misa-Höhe, ZMB 16059, 16060 and 49589.

HABITATS AND DISTRIBUTION. — This is a forest species that spends most of the time in the leaf litter. In Togo, it is found in the ecological zones II, III and IV. The northernmost place of capture was the Forêt d'Alédjo, but we suppose that it may be found also more northerly, i.e. in the forests of the region of Kara. It was first recorded in Togo by Tornier (1901) from Misa-Höhe. More recently, Greer *et al.* (1985) confirmed its presence in Misa-Höhe, and Leaché *et al.* (2006) listed it among the species occurring in the forest zone of the Togo Hills in Ghana.

Genus *Panaspis* Cope, 1868

Panaspis togoensis (Werner, 1902) (Fig. 5)

Lygosoma togoense Werner, 1902: 337.

MATERIAL EXAMINED. — 29 specimens: **Togo**. Agoté, coll. GHS-W 0890; Akloa, ZMB 77930-77934; Alédjo, 2210-2213; Assoukoko, ZMB 77935; Fazao, coll. GHS-W 0846 and 0857, coll. JFT 2197-2209; Diguengue ZMB 77936 ; Huiléhoé, coll. JFT 2329; Kebo-Dzigbe (Monts Agou), coll. GHS-W 1878-1880, Kéran (Parc national de la Kéran), coll. JFT 2306; Kpimé (Cascade de Kpimé), coll. JFT 1702; Misa-Höhe, ZMB, 16629, coll. JFT 1708; Sodo Zion, coll. JFT 2215.

HABITATS AND DISTRIBUTION. — This species was described by Werner (1902) from Bismarkburg in Togo. Later studies confirmed that it is a valid species (see Schmitz *et al.* 2005). Our surveys demonstrated its occurrence in ecological zones I, II, III, and IV. It is a secretive species, often dwelling in leaf litter. This species is particularly common in the forests of ecological zone II: for instance, many individuals were captured by us in the Fazao forests.

Chalcides thierryi Tornier, 1901

Chalcides bottegi var. *thierryi* Tornier, 1901: 87.

MATERIAL EXAMINED. — 2 specimens: **Togo**. Mango, ZMB 16607. **Ghana**. Yendi, ZMB 16284.

HABITATS AND DISTRIBUTION. — The Togolese syntype of this species was collected in Mango (ecological zone I) (Tornier 1901). This genus was reviewed by Greenbaum *et al.* (2006). The current consevation status of this species in Togo needs to be evaluated because of the strong degradation of the natural ecosystems in the North of the country. Our recent survey in the area did not allow to observe any specimens.

Family Gerrhosauridae Fitzinger, 1843
Genus *Gerrhosaurus* Wiegmann, 1828

Gerrhosaurus major (Duméril, 1851)

Gerrhosaurus major major Duméril, 1851: 139.

Material examined. — 6 specimens: **Togo**. Alédjo, RMCA 73.013.R.0011-0013.
DOA (Deutsch Ost-Afrikas). ZMB 18814.
Ghana. Kété Kratchi, ZMB: 16608 and 17699.

Habitats and distribution. — This species was first cited for Togo by Tornier (1901) from Kété-Kratchi, which today is in Ghana. It was also recently reported from the forests bordering Togo and Ghana (Leaché *et al.* 2006). In Togo it is only known in the areas of the Monts Alédjo and in the mountain chain of Atakora, hence, in the forests of ecological zone IV (Adélé) and in the dry forests of ecological zone II (Fazao Malfakassa and Alédjo forest). In 2003, Fouchard (pers. com) indicated that some specimens were collected in Hiheatro (surroundings of Atakpamé) for the international pet trade.

Notes. —Recently, Bates *et al.* (2013) erected a new genus (*Broadleysaurus*) for this species, based on molecular phylogeny data using two mitochondrial markers (ND2, 732 bp; 16S, 576 bp) and one nuclear marker (PRLR, 538 bp). Further studies should confirm whether this genus can be definitely accepted.

Family Lacertidae Gray, 1825
Genus *Acanthodactylus* Wiegmann, 1834

Acanthodactylus boueti Chabanaud, 1917

Acanthodactylus (*Latastia*) *boueti* Chabanaud, 1917: 87.

Material examined. — 1 specimen: **Togo**. Payo, RMCA 73.009.R.0148.

Distribution. — We examined only one specimen, which was collected in the northern part of the country. This is the first record for Togo. The species' distribution in Togo remains totally unknown. *A. boueti* was also collected at Bassila (Bénin) by Trape *et al.* (2012), less than 10 km from the border of Togo (ecological zone III).

Genus *Gastropholis* Fischer, 1886

Gastropholis echinata (Cope, 1862)

Lacerta (*Zootoca*) *echinata* Cope, 1862: 189.

Material examined. — 2 specimens: **Liberia.** No precise locality, ZMB 38683. **Ghana**. Koforidua ZMB 45223.

Distribution. — We never recorded this species during our surveys. Its overall distribution, ranging from Liberia to RDC (Matschie 1893; Chirio & LeBreton 2007), as well as a specimen from Koforidua, Ghana (ZMB 45223), a locality close to the border of Togo, suggests that it should be present in Togo. In Ivory Coast this arboreal forest species is also known to occur in plantations (Rödel 1996).

Genus *Holaspis* Gray, 1863

Holaspis guentheri Gray, 1863

Holaspis guentheri Gray, 1863: 152.

Material examined. — 2 specimens: **Cameroun**. Bipindi, ZMB 27197. **DOA**. No precise locality ZMB 10482.

Distribution. — This species was not recorded from Togo till recently. Leaché *et al.* (2006) found it in the mountain forests between Togo and Ghana. Thus, this species should be present in Fazao-Mafakassa National Park boarding the Kyabobo Park in Ghana, where Leaché *et al.* (2006) collected it.

Genus *Heliobolus* Fitzinger, 1843

Heliobolus nitidus (Günther, 1872)
(Fig. 6)

Eremias nitida Günther, 1872: 381.

Material examined. — 6 specimens: **Togo**. No precise locality, ZMB 16062 and 62740; Payo, RMCA 73.009.R.0149-0150. **Ghana**. Kété-Kratchi), ZMB 16603 and 62739.

Habitats and distribution. — *Heliobolus nitidus* is a species occurring in savannah and in the dry forest ecosystems (e.g., Rödel *et al.* 1997). We have recorded this species in the regions of Fazoa, Parc national de la Kéran, and in the southern areas of Vogan and Tabligbo. Its presence in the ecological zone IV is doubtful. It was first mentioned for Togo by Tornier (1901).

Family Gekkonidae Gray, 1825
Genus *Cnemaspis* Strauch, 1887

Cnemaspis spinicollis (Müller, 1907)
(Fig. 7)

Ancylodactylus spinicollis Müller, 1907: 825.

Material examined. — 7 specimens: **Togo**. Alédjo, coll. JFT 2205-2207, 2226-2227 and 2311, coll. GHS-W 1891.

Habitats and distribution. — All of our examined specimens were captured in the Alédjo forest, situated in the ecological zone II. The same area was mentioned by Trape *et al.* (2012). This gecko was first recorded for Togo by Joger (1981), but its distribution is still poorly known. It is certainly present along the mountain chain of Atacora.

Genus *Hemidactylus* Oke, 1817

Hemidactylus albituberculatus Trape, 2012

Hemidactylus albituberculatus Trape *in* Trape, Chirio & Trape, 2012: 36.

Material examined. — 6 specimens: **Togo**. Adjrala dam site, coll. GHS-W 1859-1860, Huiléhoé, coll. JFT 2170 and 2193, Tsévié, MNHN 2006.2261-2262.

Habitats and distribution. — This species was recently described from Nigeria by Trape *et al.* (2012). In Togo, it is known from Huilehoe, Tsévié and the Adjrala dam site along the Mono River.

FIG. 6. — *Heliobolus nitidus* (Günther, 1872).

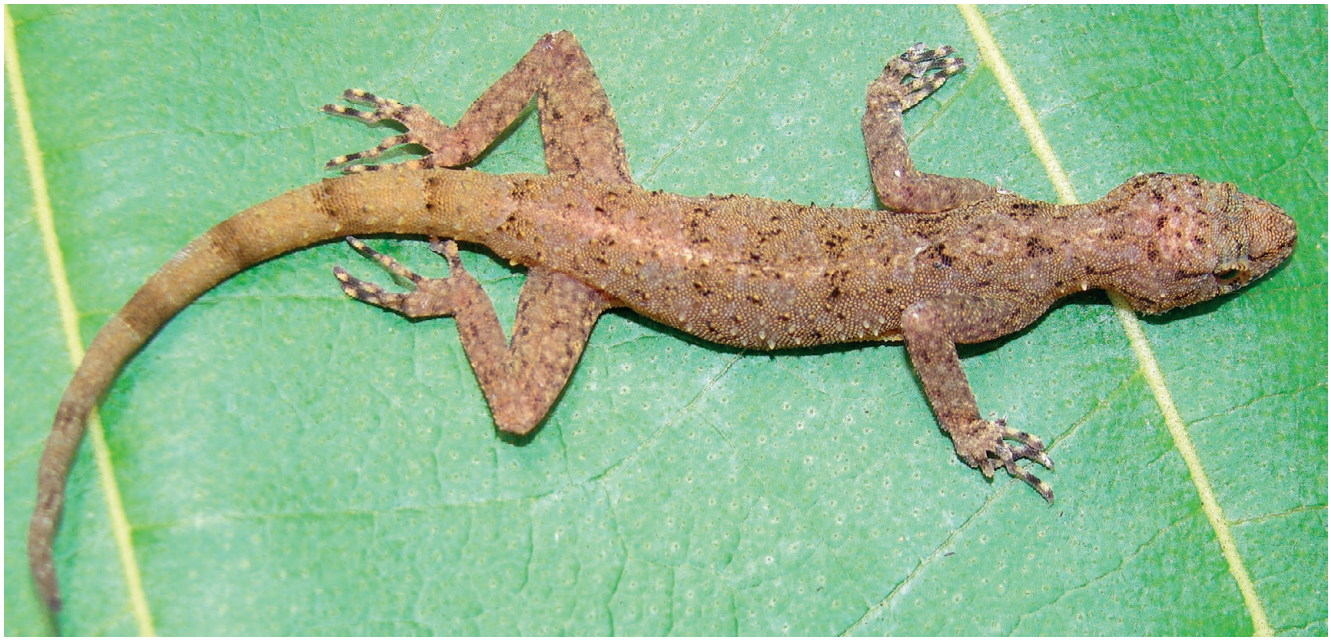

FIG. 7. — *Cnemaspis spinicollis* (Müller, 1907).

These localities are situated in the ecological zones III and V. Specimens of *Hemidactylus albituberculatus* were previously recorded in Togo (Segniagbeto 2009) but identified wrongly as *Hemidactylus angulatus* Hallowell, 1854.

Hemidactylus angulatus Hallowell, 1854 (Fig. 8)

Hemidactylus angulatus Hallowell, 1854.

MATERIAL EXAMINED. — 66 specimens: **Togo**. Agou (Kebo-Dzigbe, Mt Agou), coll. JFT 2322; Alédjo, coll. JFT 2228; Diguendué, coll. JFT 2341-2342; Huiléhoé, coll. JFT 2170-2171; 2181-2195; Kpalimé, MNHN 2006.2258, 2006.2260, 2006.2268-2272, coll. JFT 2236; Konkoaré, coll. JFT 2301-2302; Lomé, MNHN 2006.2263-2267, 2006.2273, 2006.2276, 2006.2279-2282, coll. JFT 2235; Mango, ZMB 16046 (2 specimens); Misa-Höhe, coll. JFT 1715-1720, 1724-1727; Naboulgou, MNHN 2006.2259, 2006.2271, 2006.2274-2275 and 2006.2277-2278; undetermined locality, ZMB 17152 (4 specimens), ZMB 16045 (5 specimens).
Ghana. Kété-Kratchi, ZMB 13805 and 16042.

HABITATS AND DISTRIBUTION. — This is one of the most common reptile species in human settlements in Togo, but likewise found in nearly every other habitat type. It was previously cited for Togo by Matschie (1893), Werner (1898, 1899, 1902), and Tornier (1901) for the localities of Bismarkburg (Adélé), Mango, Atakpamé, and Kété-Kratchi (now in Ghana). Its presence in Togo was also reported by Loveridge (1947) and Grandison (1956).

Hemidactylus fasciatus Gray, 1842
(Fig. 9)

Hemidactylus fasciatus Gray, 1842: 58.

MATERIAL EXAMINED. — 13 specimens: **Togo**. Misa-Höhe, ZMB 16163, 16048, 16048, 16302 and 15853, coll. JFT 1710-1711, 1723, 2238-2240.
Ivory Coast. No precise locality, MNHN 46.98-99.

HABITATS, NATURAL HISTORY AND DISTRIBUTION. — This is a forest species occurring on trees, but also in caves, and close to waterfalls as well as in houses (Rödel *et al.* 1997). It ranges from the forest zone into gallery forests of the Guinea savannah. In Togo is found only in the ecological zone IV. We recorded this species in the Misa-Höhe forest and in the Kouma-Konda mountains. It was recorded for Togo by Matschie (1893), Tornier (1901), Loveridge (1947), Grandison (1956), Joger (1981) and Bauer *et al.* (2006). In South-Eastern Nigeria, where it inhabits especially swamp forests, dry forests and mangroves (Luiselli *et al.* 2007), it shows a generalist insectivorous diet, with Arachnida, Formicoidea and Termites being the main prey categories (Rugiero *et al.* 2007).

Hemidactylus kyaboboensis Wagner, Leaché & Fujita, 2014
(Fig. 10)

Hemidactylus kyaboboensis Wagner, Leaché & Fujita, 2014: 3.

MATERIAL EXAMINED. — 1 specimen: **Togo**. Assoukoko, ZMB 77924.

HABITATS AND DISTRIBUTION. — The single Togolese specimen of this species, recently described from Ghana and Togo, was collected in Assoukoko forest. This hilly forest is moist semi-deciduous, and is situated in the Togo Hills at the border between Togo and Ghana. This forest is nearby the type locality of this species, i.e. Kyabobo National Park. According to Wagner *et al.* (2014), the specimens of the species have been recorded in Missahohe, Bafilo in Togo. Based on these data, it is clear that the distribution area of this species included the Ecological zones IV and II of the country.

FIG. 8. — *Hemidactylus angulatus* Hallowell, 1854.

FIG. 9. — *Hemidactylus fasciatus* Gray, 1842.

Hemidactylus mabouia (Moreau de Jonnès, 1818)
(Fig. 11)

Gekko mabouia Moreau de Jonnès, 1818: 138.

MATERIAL EXAMINED. — 10 specimens: **Togo**. Kpalimé, coll. JFT 2237; no precise locality, ZMB 11259 (2 specimens).
BOA (Britisch Ost-Afrika): ZMB 19181.
DOA (Deutsch Ost-Afrikas): ZMB 22505.
Ghana. Atewa Forest, coll. GHS-W 0628.
Liberia. Monrovia, MNHN 1990 849.
POA (Portugese Ost-Afrika): ZMB 27555.

HABITATS, NATURAL HISTORY AND DISTRIBUTION. — This species occurs across all Togolese ecosystems, and is common in human settlements (where it can be easily confused with *H. angulatus*). It is common in towns such as Kpalimé and Lomé. It was recorded in Togo by Matschie (1893) and Tornier (1901) on the basis of two specimens collected in Bismarkburg (currently Adélé). Its occurrence in the country was also confirmed by Loveridge (1947) and Bauer *et al.* (2006). In South-Eastern Nigeria, where it also occurs around human settlements (Luiselli *et al.* 2007), *Hemidactylus mabouia* feeds especially on adult Lepidoptera (Rugiero *et al.* 2007).

FIG. 10. — *Hemidactylus kyaboboensis* Wagner, Leaché & Fujita, 2014.

FIG. 11. — *Hemidactylus mabouia* (Moreau de Jonnès, 1818).

FIG. 12. — *Hemitheconyx caudicinctus* (Duméril, 1851).

Hemidactylus matschiei (Tornier, 1901)

Bunocnemis matschiei Tornier, 1901: 71.

MATERIAL EXAMINED. — 2 specimens: **Togo**. Bismarkburg ZMB 16605 (holotype of *Hemidactylus matschiei*), coll. JFT 4230.

HABITATS AND DISTRIBUTION. — This species was described by Tornier (1901) on the basis of a specimen from Bismarkburg (currently Yégué in Adélé). A recent study undertaken by Trape *et al.* (2012) confirmed the presence of this species in the same area. So far no further locality has become known. Its habitat is characterized by tropical wet forests or semi-deciduous forests with degraded zones.

Hemidactylus muriceus Peters, 1870

Hemidactylus muriceus Peters, 1870: 641.

MATERIAL EXAMINED. — 2 specimens: **Togo**. Misa-Höhe, ZMB 13773 (holotype of *Hemidactylus intestinalis* Werner, 1897) and ZMB 16609 (juvenile).

HABITATS AND DISTRIBUTION. — This species was recorded for Togo through a specimen collected in Misa-Höhe (Tornier, 1901). The holotype of *Hemidactylus intestinalis* was also collected in Misa-Höhe. Its presence in Togo was confirmed by Perret (1975). Henle & Böhme (2003) and Trape *et al.* (2012) indicated the presence of this species in the forest area bordering Ghana.

Genus *Lygodactylus* Gray, 1864

Lygodactylus conraui Tornier, 1902

Lygodactylus conraui Tornier, 1902: 670.

HABITATS, NATURAL HISTORY AND DISTRIBUTION. — *Lygodactylus conraui* is a diurnal species inhabiting the West African savannahs and open forests from Sierra Leone to Cameroun (Loveridge 1947; Pasteur 1965). It was first reported to occur in Togo by Bauer *et al.* (2006) for the locality of Zogbégan (specimen IRSNB 17158), situated inside ecological zone IV. Its further distribution in Togo is unknown. In South-Eastern Nigeria, it occurs widely in forests (both swamped and dry; Luiselli *et al.* 2007), and feeds mainly on adult Lepidoptera (Rugiero *et al.* 2007).

Lygodactylus gutturalis (Bocage, 1873)

Hemidactylus gutturalis Bocage, 1873: 211.

MATERIAL EXAMINED. — 1 specimen: **Togo**. Mangu (Mango), ZMB 80497.

HABITATS AND DISTRIBUTION. — Dunger (1968) reported its presence in the western regions of Nigeria, and Leaché *et al.* (2006) recorded its presence in Ghana. Its distribution in Togo is unknown. The only specimen known from Togo was captured in Mango, and represents the first record from the country.

Family EUBLEPHARIDAE Boulenger, 1883
Genus *Hemitheconyx* Stejneger, 1893

Hemitheconyx caudicinctus (Duméril, 1851) (Fig. 12)

Stenodactylus caudicinctus Duméril, 1851: 48.

MATERIAL EXAMINED. — 8 specimens: **Togo**. Atakpamé, MRAC 73 14 R 21; Binaparba, MRAC 73 9 R 53; Tohoun, coll. GHS-W 1266; no precise locality, ZMB 16035 and 16036.
Ghana. Kété-Kratchi, ZMB 29023, 19798, 48752 and 16071.

HABITATS AND DISTRIBUTION. — This species occurs in savannah ecosystems (both Guinea and Sudanese savannahs), and in the dry forests of ecological zone II. Overall, it is found in ecological zones I, II, and III. Its presence in ecological zone IV is probable, but

FIG. 13. — *Ptyodactylus ragazzi* Anderson, 1898.

FIG. 14. — *Tarentola ephippiata* O'Shaughnessy, 1875.

not confirmed. It was first recorded in Togo by Tornier (1901) for Sokodé, Kété-Kratchi (today in Ghana), and Mango. Loveridge (1947), Grandison (1956) and Bauer *et al.* (2006) mentioned its presence in Togo as well. This species is intensively harvested for the international pet trade; for instance, between 2000 and 2005, a total of 2485 live specimens were exported according to the CITES commission of the DFC of the Ministère de l'Environnement.

Family PHYLLODACTYLIDAE
Gamble, Bauer, Greenbaum & Jackman, 2008
Genus *Ptyodactylus* Owen, 1817

Ptyodactylus ragazzi Anderson, 1898
(Fig. 13)

Ptyodactylus hasselquistii var. *ragazzii* Anderson, 1898: 69.

MATERIAL EXAMINED. — 12 specimens: **Togo**. Dapaong, coll. JFT 2300; Nanergou, RMCA 73.009.R.0023-0031; no precise locality, ZMB 16312 and 16622.

HABITATS AND DISTRIBUTION. — It is a species occurring in Sudanese savannah and in the dry forests. This species was reported to occur in Togo as *Ptylodactylus hasselquistii togoensis* by Tornier (1901) from the locality of Zogbegan. This latter taxon was put into synonymy with *Ptylodactylus ragazzi* Anderson, 1898 by Heimes (1987). The species was also recorded in Togo by Loveridge (1947) and Bauer *et al.* (2006).

Genus *Tarentola* Gray, 1825

Tarentola ephippiata O'Shaughnessy, 1875
(Fig. 14)

Tarentola ephippiata O'Shaughnessy, 1875: 263.

MATERIAL EXAMINED. — 8 specimens: **Togo**. Mango, ZMB 16627 and 16306; coll. GHS-W 1892-1895; Sabiegou, MNHN 2006.2200. **Ghana**. Kété Kratchi, ZMB 16307.

HABITATS AND DISTRIBUTION. — *Tarentola ephippiata* is a species occurring essentially in the Sudanese savannah zone. However, it can be found also in the hilly open and dry forests of ecological zone II. This species was first mentioned for Togo by Tornier (1901) for Mango and Yendi (nowadays in Ghana), and later by Loveridge (1947) and Bauer *et al.* (2006).

Family AGAMIDAE Linnaeus, 1758
Genus *Agama* Daudin, 1802

Agama agama (Linnaeus, 1758)

Lacerta agama Linnaeus, 1758: 207.

MATERIAL EXAMINED. — 26 specimens: **Togo**. Agoté, coll. JFT 1729-1730; Agou, MRAC 73014.0001; Alédjo, RMCA 73.009.R.0070; Badou, RMCA 73.009.R.0069; Dapaong, RMCA 73.009.R.0071; Diguengue, coll. JFT 2318; Fazao, coll. JFT 2202; Kéran (Parc national de la Kéran), coll. JFT 2304; Kontoaré, coll. JFT 2303; Lomé, coll. GHS-W 1301-1310; Misa-Höhe, coll. JFT 1714; Notsé, MRAC 73009.0038, 73009.0046 and 73009.0056. Payo, RMCA 73.009.R.0086 and 73.009.R.0098.

HABITATS AND DISTRIBUTION. — This is an anthropophilous species, which is extremely abundant around human settlements. The diet of this species in Lomé was studied by Akani *et al.* (2013). The Lomé populations showed an insectivorous diet more similar to that of Cotonou (Benin), also situated in the Dahomey Gap, than to those of the forest towns in Nigeria (Akani *et al.* 2013).

NOTES
This species complex was recently reviewed by Mediannikov *et al.* (2012) and Trape *et al.* (2012) who demonstrated that specimens from Togo belong to the nominal form. Trape *et al.* (2012) indicated a scale range of 60-82 at mid-body; the specimens examined by us in Togo fall within this range (68-72). The presence of *A. agama* in Togo was reported by several authors (Matschie 1891, 1893; Tornier 1901; Grandison 1956).

Agama doriae Boulenger, 1885

Agama doriae Boulenger, 1885: 127.

DISTRIBUTION. — We did not examine any specimen of this species. PNAE (2002) and Chirio & LeBreton (2007) list this species for Togo without mentioning any specific record. Trape *et al.* (2012) indicated that this species may occur in Togo since the westernmost record was near Accra, Ghana.

FIG. 15. — *Chamaeleo gracilis* Hallowell, 1842.

Agama gracilimembris Chabanaud, 1918

Agama gracilimembris Chabanaud, 1918: 106.

MATERIAL EXAMINED. — 5 specimens: **Togo**. Moba (probably Dapaong area) ZMB 25880a, 25880b, Mango ZMB 25885a, 25885b and 25885c.

HABITATS AND DISTRIBUTION. — This is another anthropophilous species which occurs in the northern part of the country (ecological zone I). However, we here record it for the first time from Togo. The ZMB specimens were confused with young *A. agama*. Further museum specimens are probably still considered as being *A. agama*. The distribution of this species in other ecological zones, especially ecological zone II, is likely.

Agama parafricana Trape, Mediannikov & Trape, 2012

Agama parafricana Trape, Mediannikov & Trape, 2012: 133.

MATERIAL EXAMINED. — 1 specimen: **Togo**. Asrama Forest coll. JFT 3130

HABITATS AND DISTRIBUTION. — This arboreal savannah species was recently described from Togo. It occurs in the ecological zone III. Additional data are required in order to understand properly the distribution of this species. As the type locality is closed to Togodo North and South National Park, its presence in this forest is probable.

Agama sankaranica Chabanaud, 1918

Agama sankaranica Chabanaud, 1918: 105.

MATERIAL EXAMINED. — 11 specimens: **Togo**. Agoé, coll. GHS-W 1311-1316; Alédjo, coll. JFT 2309; Notsé, coll. GHS-W 1316-1320.

HABITATS AND DISTRIBUTION. — *Agama sankaranica* is locally very common in savannah areas, including also coastal sites at about 10 m linear distance from the sea. Females of this species usually nest in sandy spots bordering small paths in savannah grasslands. *Agama sankaranica* was first cited for Togo by PNAE (2002).

Family CHAMAELEONIDAE Rafinesque, 1815
Genus *Chamaeleo* Laurenti, 1768

Chamaeleo gracilis Hallowell, 1842 (Fig. 15)

Chamaeleo gracilis Hallowell, 1844: 111.

MATERIAL EXAMINED. — 41 specimens: **Togo**. Agoté, coll. JFT 1712-1713; Alédjo, RMCA 73.013.R.0032; Bismarkburg (Adélé) ZMB 16083, 64156, 16082, 64153, 16026, 10789, 16084, 64157, 16085, 16027, 64154, 10788, 64146-64152, 11243. Gandu (currently Gando) ZMB 160229a, 160229b; Kpalimé, RMCA73.054.R.0001-0002; Niamtougou, RMCA 73.011.R.0086-0087 and 85.003.R.0148, Zebbe (currently Zebevi in Aneho) ZMB 16028.
Ghana. Accra ZMB 5852, 6684a, 6684b, 6523a, 6523b; Kete Kratchi ZMB 13806, 16030, 16295, 26692, 64155, Yendi ZMB 16294.

HABITATS AND DISTRIBUTION. — This is a savannah-dwelling species which also occurs in the forest-savannah ecotone (e.g., Branch & Rödel 2003; Böhme *et al.* 2011) and in lowland forests (Luiselli 2006). It was recorded for Togo by Tornier (1901) from Sebbe (closed to Aneho), Gando, Misa-Höhe, Bismarkburg (currently Adélé), and Kete-Kratchi and Yendi (nowadays in Ghana). Its presence in Togo was also confirmed by Klaver & Böhme (1997) and Ullenbruch *et al.* (2007). It is heavily harvested for the international pet trade: according to the CITES division of the DFC, 6397 live specimens were exported from Togo between 2001 and 2005. The species is also widely available in the fetish markets (Segniagbeto *et al.* 2013).

Chamaeleo necasi Ullenbruch, Krause & Böhme, 2007

Chamaeleo necasi Ullenbruch, Krause & Böhme, 2007: 6.

MATERIAL EXAMINED. — 5 specimens: **Togo**. Badou, RMCA 73.009.R.0142-0143; Yo (Agome Yo), RMCA R.27085 (Paratype); Missa-Hohe ZMB 44008; Bismarkburg ZMB 16086.

HABITATS AND DISTRIBUTION. — *Chamaeleo necasi* was recorded in Togo under the name of *Chamaeleo quilensis* Bocage, 1886 by De Witte (1965). This species is part of a species complex which are either recognized as distinct species or as "forms" of a single species *Chamaeleo dilepis*. The distribution of *Chamaeleo dileptis* "*quilensis* form" extends from Cameroon to South Africa (Tilbury 2010). The presence of this form in Togo indicated by Chirio & LeBreton (2007) as *Chamaeleo quilensis* seems to be dubious and Ullenbruch *et al.* (2007) already mentioned that more research is needed to understand the distribution of this species. The type and paratypes of *Chamaeleo necasi* came from the Togolese localities of Kpalimé, Yoh or Yo (Agome Yo) and Misa-Höhe (Ullenbruch *et al.* 2007). In Togo, this species is restricted to the forest zone. It is probable that many specimens of this species are confused with *C. gracilis* in the international pet trade. All the reptile farmers interviewed by us apparently did not distinguish between the two species.

Chamaeleo senegalensis Daudin, 1802 (Fig. 16)

Chamaeleo senegalensis Daudin, 1802: 203.

MATERIAL EXAMINED. — 15 specimens: **Togo**. Alédjo, RMCA 73.011.R.0082-0085; Borgou, RMCA 73.011.R.0015; Huiléhoé, coll. JFT 2330-2333; Niamtougou, RMCA 73.011.R.0067-0070, 73.011.R.0079; Togoville, RMCA 73.011.R.0071.

HABITATS AND DISTRIBUTION. — *Chamaeleo senegalensis* is a typical savannah inhabitant, that can be found also at the border of the rainforest and inside open forests (for instance in the Niger Delta of southern Nigeria; L. Luiselli unpublished data). This species is particularly common in Togo in the ecological zones I and II, but is also present in all other ecological zones. In Togo it is generally associated with bushlands and thickets, often close to wet areas, in the savannah region. This species was recorded in Togo by Tornier (1901) for the localities of Bismarkburg (currently Adélé), Mango, Sokodé, and Kete-Kratchi and Yendi (now in Ghana). It is heavily exploited for the international pet trade, e.g., about 3000 specimens are exported from Togo each year.

Family VARANIDAE Gray, 1827
Genus *Varanus* Merrem, 1820

Varanus exanthematicus (Bosc, 1792)

Lacerta exanthematicus Bosc, 1792: 25.

MATERIAL EXAMINED. — 7 specimens: **Togo**. Bassar, ZMB 16041; Binanparba, RMCA 73.009.R.0188-0189; Bismarkburg (actually Yégué in Adélé), ZMB 11254; Moba (actually Dapaong), ZMB 24920; Mango, ZMB 16040; Sokodé, ZMB 16275.

HABITATS AND DISTRIBUTION. — This is a widespread species in the Guinea and Sudanese savannahs. It was recorded by Matschie (1893) and Tornier (1901) for Bismarkburg, Bassar, Mango, Sokodé and Yendi (actually in Ghana). It was also generally reported to occur in Togo by Bayless (2002). It is heavily exported for the international pet trade: for instance, according to the CITES division of the DFC, 20350 live specimens were exported between 2001 and 2005 (see also Affre *et al.* 2005).

Varanus niloticus (Linnaeus, 1766)

Lacerta nilotica Linnaeus, 1766: 369.

MATERIAL EXAMINED. — 10 specimens: **Togo**. Agou, MRAC 73014.0010, 73014.0054; Borgou (Dapaong), Mango, ZMB 16039; Sokodé, ZMB 53519 and 16276.
Ghana. Kéta, ZMB 13833, ZMB 25879; Kété Kratchi, ZMB 26788 and 16037.

HABITATS AND DISTRIBUTION. — This is a widespread species, occurring in all habitat types in Togo. It is locally abundant, for instance along the Mono River, the Lake Togo, and in Togodo National Park. This species was recorded in Togo for the first time by Matschie (1891, 1893). Tornier (1901) recorded this species from Sokodé, Mango, Sebbe (Zebé, actually Aného), Bismarkburg (Adélé) and Kété-Kratchi (actually in Ghana). Other authors also recorded this species in the country (Werner 1898; Böhme & Ziegler 1997; Bayless 2002). It is heavily exploited for the international pet trade: according to the CITES division of the DFC, a total of 19889 live specimens were exported between 2001 and 2005 (see also Affre *et al.* 2005). Eniang *et al.* (2014a) showed that West African *V. niloticus* populations, despite being relatively habitat generalist, do not select habitat types in relation to their availability, and that they shift resting places ontogenetically, with smaller individuals being relatively more arboreal than adults.

Varanus ornatus (Daudin, 1803)

Tupinambis ornatus Daudin, 1803: 353.

MATERIAL EXAMINED. — 10 specimens: **Togo**. Bismarkburg (Adélé), 16105, 11269, 13832, 53511-53513 and 12253; Misa-Höhe, ZMB 53522 and 29003.

HABITATS AND DISTRIBUTION. — This species was considered as a form of *V. niloticus* until Böhme & Ziegler (1997) clarified its taxonomic

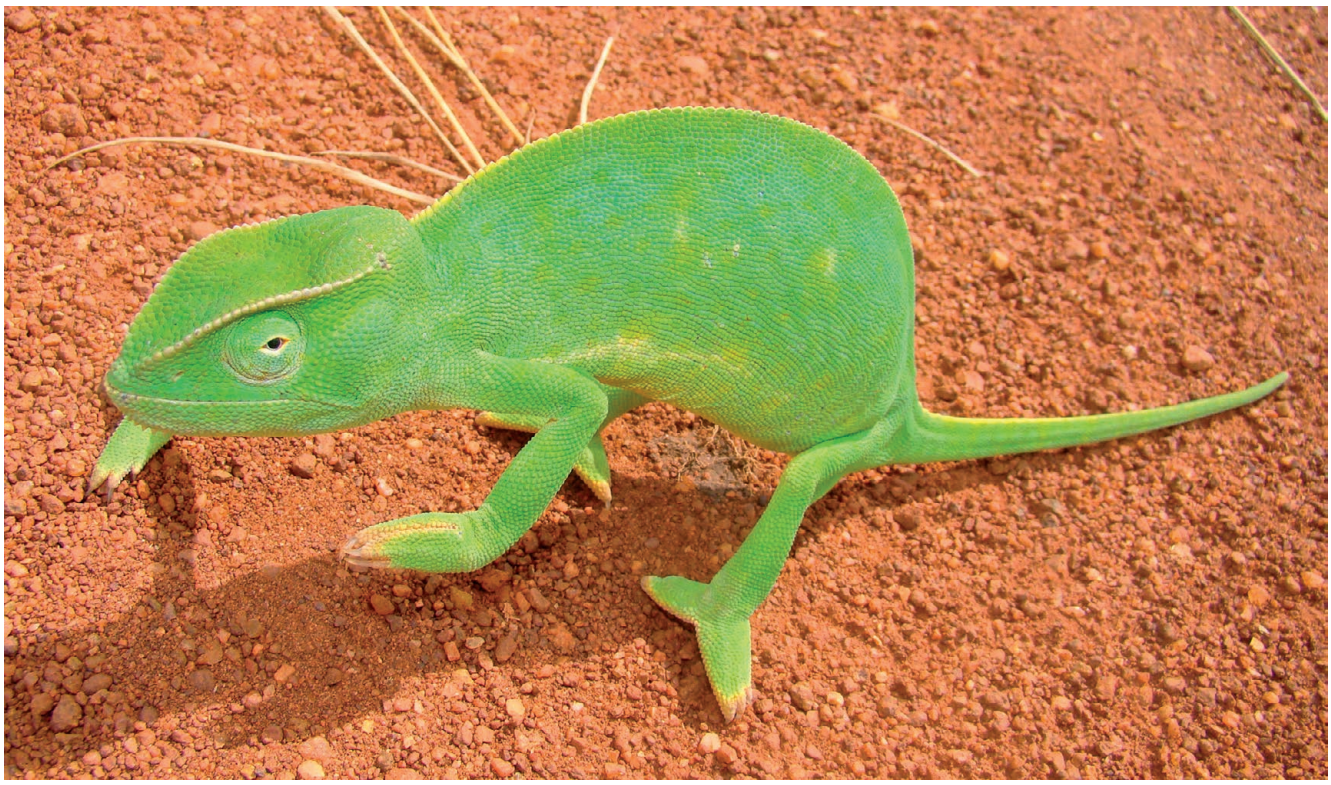

FIG. 16. — *Chamaeleo senegalensis* Daudin, 1802.

status. In Togo, it is found in the forests of ecological zone IV, as well as in the coastal marshlands and swamps and in the mangrove swamps. Its presence in Togo was first mentioned by Matschie (1891), and later by Tornier (1901) and Mertens (1942a-c) from Bismarkburg (Adélé) and Sebbe (Zébé actually Aného), under the synonymy of *Varanus niloticus*. Bayless (2002) confirmed its presence in the country. From the ecological point of view, it is noteworthy that in Togo this species occurs syntopically with *Varanus niloticus* (for instance, from Aneho: 06°13'44.30"N, 01°36'22.80"E to Yegue: 08°10'58.80"N, 00°38'60.00"E), whereas the two species always occur parapatrically or allopatrically in Nigeria (Angelici & Luiselli 1999). The diet of this species was studied in the mangrove and swamp forest habitats of southern Nigeria, and there it has been seen mainly feeding upon crabs (Luiselli *et al.* 1999). This species is certainly exploited for the international pet trade, but the number of exported individuals remains unknown given that they are exported under the *V. niloticus* quotas.

Family AMPHISBAENIDAE Gray, 1865
Genus *Cynisca* Gray, 1844

Cynisca leucura (Duméril & Bibron, 1839) (Fig. 17)

Amphisbaena leucura Duméril & Bibron, 1839: 498.

MATERIAL EXAMINED. — 14 specimens: **Togo**. Alédjo, GSH-W 1470, Fazao, coll. GHS-W 1449-1452; Kleine Popo (Aneho) ZMB 14153; Lobodji ZMB 16069a, 16069b, Mango ZMB 24918a, 24918b, 24919 16068, 24917 and N'Gambi, coll. GHS-W 0596. Other locality. Ghana: Aniaco (Anyako) ZMB 9375.

HABITATS AND DISTRIBUTION. — This species is found throughout Togo. It was, for example, captured at N'Gambi, Alédjo, Fazao, and Nangbeto. These records indicate that it inhabits all five ecological zones. Tornier (1901) was the earliest authority to cite its presence in Togo, with specimens collected from Kete-Kratchi (now in Ghana), Sokodé, Mango, and Klein Popo (actually Aneho). Loveridge (1941) also confirmed the presence of this species in Togo.

FIG. 17. — *Cynisca leucura* (Duméril & Bibron, 1839).

Cynisca muelleri (Strauch, 1881)

Amphisbaena mülleri Strauch, 1881: 369, 389.

HABITATS AND DISTRIBUTION. — This species is known to occur from Ghana to Sierra Leone. Matschie (1893) suggested that *Cynisca muelleri* is present also in Togo. However, no records are known, and we failed to find it as well.

TABLE 2. — Ecological distribution of the lizard species native to Togo on the basis of their presence/absence in the five Togolese ecological zones. For more details, see the text.

	Ecological zone				
Species	**I**	**II**	**III**	**IV**	**V**
Agama agama (Linnaeus, 1758)	1	1	1	1	1
A. doriae Boulenger, 1885	1	1	0	0	0
A. gracilimembris Chabanaud, 1918	0	1	1	0	0
A. parafricana Trape, Mediannikov & Trape, 2012	0	0	1	0	0
A. sankaranica Chabanaud, 1918	0	0	1	0	1
Chalcides thierryi Tornier, 1901	1	0	0	0	0
Chamaeleo gracilis Hallowell, 1842	0	1	1	1	1
C. necasi Ullenbruch, Krause & Böhme, 2007	0	0	0	1	0
C. senegalensis Daudin, 1802	1	1	1	1	1
Cnemaspis spinicollis (Müller, 1907)	0	1	0	0	0
Cophoscincopus simulans (Vaillant, 1884)	0	0	0	1	0
Cynisca leucura (Duméril & Bibron, 1839)	1	1	1	0	0
Gerrhosaurus major (Duméril, 1851)	0	1	0	1	0
Heliobolus nitidus (Günther, 1872)	1	0	0	0	0
Hemidactylus angulatus Hallowell, 1854	0	0	0	1	0
H. fasciatus Gray, 1842	0	0	0	1	0
H. kyaboboensis Wagner, Leaché & Fujita, 2014	0	1	0	1	0
H. mabouia (Moreau de Jonnès, 1818)	1	1	1	1	1
H. matschiei (Tornier, 1901)	0	0	0	1	0
H. muriceus Peters, 1870	0	0	0	1	0
Hemitheconyx caudicinctus (Duméril, 1851)	1	1	1	0	0
Holaspis guentheri Gray, 1863	0	0	0	1	0
Lepidothyris fernandi (Burton, 1836)	0	0	0	1	0
Lygodactylus conraui Tornier, 1902	0	0	0	1	0
L. gutturalis (Bocage, 1873)	0	0	0	1	0
Mochlus guineensis (Peters, 1879)	0	1	1	1	0
Panaspis togoensis (Werner, 1902)	1	1	1	1	0
Ptyodactylus ragazzi Anderson, 1898	0	0	0	1	0
Tarentola ephippiata O'Shaughnessy, 1875	0	1	0	0	0
Trachylepis affinis (Gray, 1839)	1	1	1	1	0
T. aureogularis (Müller, 1885)	0	1	0	0	0
T. buettneri (Matschie, 1893)	0	1	0	1	0
T. maculilabris (Gray, 1845)	1	1	1	1	0
T. perrotetii (Duméril & Bibron, 1839)	0	0	0	1	0
T. quinquetaeniata (Lichtenstein, 1823)	1	1	1	1	1
Varanus exanthematicus (Bosc, 1792)	1	1	1	1	1
V. niloticus (Linnaeus, 1766)	1	1	1	1	1
V. ornatus (Daudin, 1803)	0	0	0	1	1

DISCUSSION

Whereas the list of lizard species from Togo provided by Tornier (1901) reported 28 species, our study confirmed the presence of 40 species and suggests the presence of further three species, which gives a total of 43 species, in the country based on the analysis of a total of 565 specimens. The results of this study allow us to add several new species to the lizard fauna of Togo, i.e. *Trachylepis aureogularis*, *Trachylepis polytropis*, *Lepidothyris fernandi*, *Acanthodactylus boueti*, *Lygodactylus gutturalis* and *Agama gracilimembris*. Some other West African species, like *Agama africana* Hallowell, 1844, *Agama paragama* Grandison, 1968, *Hemidactylus albivertebralis* Trape & Böhme, 2012, *Hemidactylus ansorgii* Boulenger, 1901, *Hemidactylus lamaensis* Ullenbruch, Grell & Böhme, 2010, *Acanthodactylus guineensis* (Boulenger, 1887), *Mochlus brevicaudis* (Greer, Grandison & Barbault, 1985) may occur in the country. The presence of other species, like *Gastropholis echinata*, *Holaspis guentheri*, *Lygodactylus conraui*, *Lygodactylus gutturalis*, *Agama doriae* and *Cynisca muelleri,* need to be confirmed in Togo by collecting voucher specimens. We include these species in the lizards list of Togo because of their regional distribution but also the fact that the localities where their specimens have been collected in Ghana or in Benin are close to the Togo boarder. The knowledge on the distribution of few other species, mentioned to occur in Togo by scientists operating during the German colonial period and not recorded for more than a century, needs to be updated. These species are *Chalcides thierryi*, *Gerrhosaurus major zechi,* and *Hemidactylus muriceus*.

The ecological distribution of the various lizard species, based on their occurrence across the five ecological zones of Togo, is synthesized in Table 2. There is an uneven distribution of the number of lizard species by vegetation zone: indeed, ecological zone IV, despite being the smallest in terms of area, harbors the greatest number of species (n = 27), followed by ecological zone II (n = 21). The other three ecological zones housed the least number of species (respectively, 14 for ecological zone I, 16 for III, and 9 for V). This uneven number of recorded species may, however, not only depend on ecological factors [i.e. the presence of hilly forests in ecological zone I, with forest habitats always housing higher species richness than other habitat types in sub-Saharan Africa; see Trape *et al.* (2012)], but also on the relative number of sampled localities. In fact, ecological zone IV was, together with V, the most sampled of all five vegetation zones (Figure 1).

A dendrogram (Fig. 18) showed six clusters of species; the factors leading to the grouping of the species does not appear clearly for some of the groups:

a) a cluster consisting of six species with relatively generalist habitats, that may occur from the Sudanese savannah to the forest regions but not in the coastal areas, i.e. the gecko *Hemitheconyx caudicinctus*, the amphisbaenian *Cynisca leucura,* and four scincid lizards of the genera *Trachylepis, Panaspis*, and *Lepidothyris*;

b) a cluster of four species with a country-wide distribution, including also the human settlements (e.g., *Agama agama*);

c) a three-species (two Varanidae and the chameleon *Chamaeleo gracilis*) cluster of species with preference for savannah habitats, but also entering the forest and avoiding the driest regions;

d) a cluster of 15 species with a clear preference for forest zones;

e) a cluster with three Agamidae species linked to Guinea savannah (*Agama gracilimembris, Agama parafricana, Agama sankaranica*);

and f) a cluster consisting of six species inhabiting dry savannah regions (ecological zones I and/or II).

CONSERVATION

The great majority of the lizards of Togo are not under immediate threats that may affect their population sizes at the global scale (most of them are not threatened according to IUCN red list). However, some populations may be locally threatened and eventually prone to disappearance due to human settlement developments and consequent habitat loss.

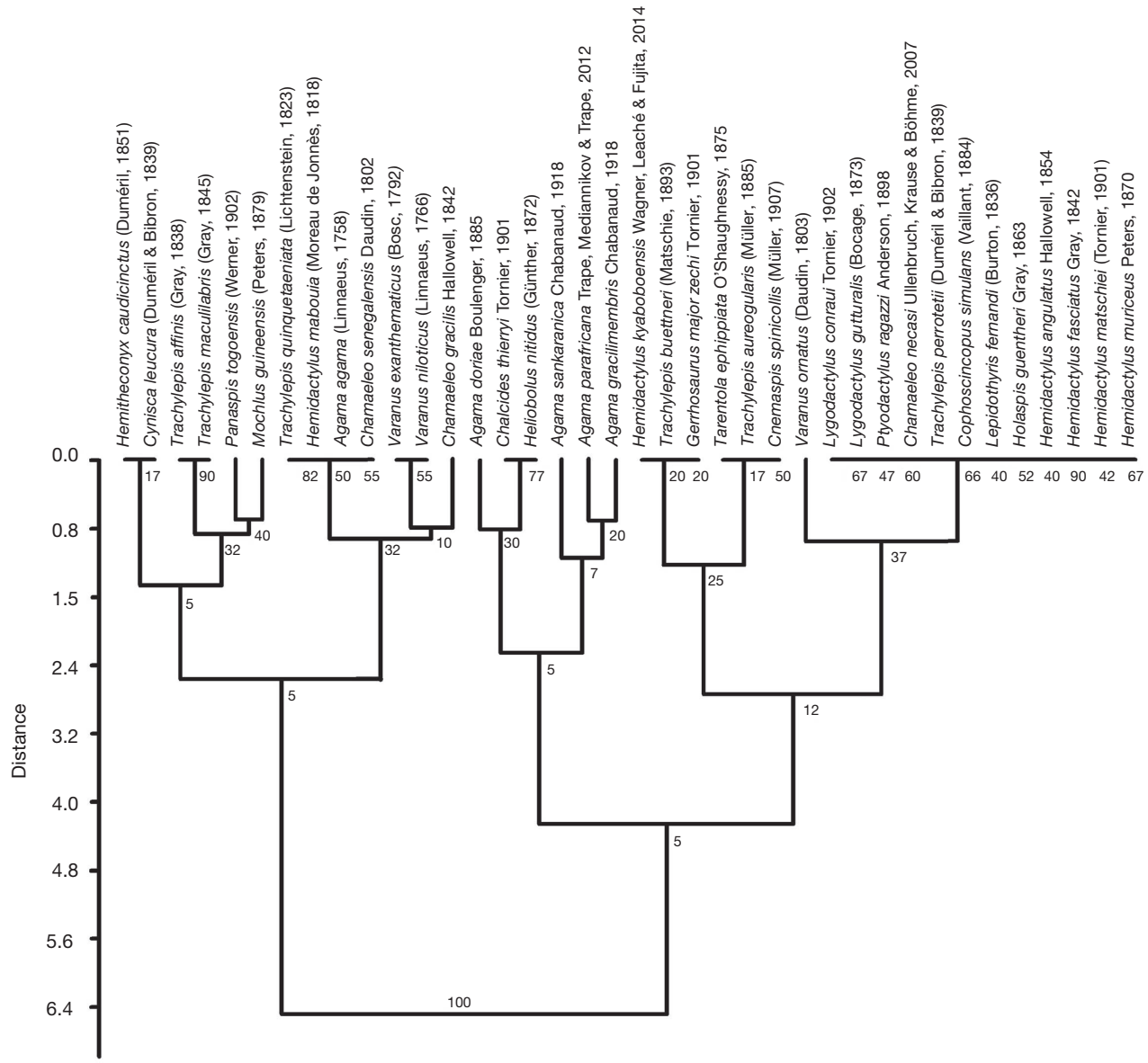

FIG. 18. — Dendrogram showing the dissimilarities among species as for their ecological distribution (presence/absence) across the five ecological zones of Togo. Numbers subtending branches indicate branching measurements based on 40 bootstraps as re-sampling. Precisely, each number indicates the percentage of replicates where each node was still supported.

A major threat could be the exploitation of natural populations due to the international pet trade, which in Togo is more developed than in most of the other African countries. Based on the data given by CITES authorities of Togo, the main lizard species collected and exported for the international pet trade are *Trachylepis quinquetaeniata, Lepidothyris fernandi, Hemitheconyx caudicinctus, Chamaeleo gracilis, Chamaeleo senegalensis, Varanus exanthematicus, Varanus niloticus,* and possibly *Varanus ornatus* (which is, however, exported under the name of *niloticus*, and hence difficult to monitor in terms of its exploitation). Out of these species only *Varanus ornatus* may be somewhat affected by the trade because of its more specialized habitat selection (Angelici & Luiselli 1999) and its more restricted distribution area in Togo. However, the current level of exploitation for this species (and of course also for the other species) seems sustainable, although more detailed field studies are needed to verify population trends of these commercially exploited taxa.

Habitat degradation is obviously another of the main causes of possible threat for lizard species in Togo, particularly in the forest zone where deforestation is rampant. Unfortunately, there are no studies quantifying the potential population declines for any of the forest species of Togolese lizards, and this lack of information makes impossible to assess the potential synergic negative effects of pet trade and habitat loss on the native lizards of Togo.

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