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## REPTILES TRADED IN THE FETISH MARKET OF LOMÉ, TOGO (WEST AFRICA)

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**Abstract.**—Fetish beliefs are important to the culture of West African people. Many animals, including reptiles, are traded in fetish markets and used for traditional medicine and for their perceived magical properties. There are few available quantitative surveys of the reptiles traded in such fetish markets in the international literature. Here, we report the results of a survey of the reptiles traded in the largest fetish market of West Africa (situated in Lomé, Togo). The market was visited in three distinct periods (July 2012, December 2012, and February 2013), but counts of all traded specimens were done only in December 2012. A total of 1,765 reptile individuals, belonging to 37 different species, were recorded. The great majority of species came from two vegetation zones (forest and Guinea savannah), with the great majority of individuals coming from the Guinea savannah region. Chameleons (*Chamaeleo senegalensis*) dominated in the sample. Among snakes, the Puff Adder (*Bitis arietans*) was frequently traded. The conservation implications of the observed pattern are discussed.

**Key Words.**—conservation; fetish market; Reptilia; Togo; West Africa

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### INTRODUCTION

Trade in animals for the purposes other than for food or as pets is on the increase. The Chinese medicine trade and its impacts on wildlife are particularly well known (e.g., Bauer 2009), including its impacts on African wildlife (rhino horns especially; Leader-Williams 1992). Reptiles are often of particular focus (Simelane and Kerley 1997, 1998); for example, Bauer 2009 addresses the depletion of Tokay Geckos (*Gekko gecko*) in southeastern Asia for the production of potions. In Asia, the economic boom has obviously seen an increase in the demand for what were previously small-market trinkets, traditional medicines, and what one may call a “fetish”. Indeed, a ‘fetish’ is defined as an animal, plant, or mineral-derived part that is used in traditional religion or traditional medicine practices (Mockler-Ferryman 1898; Nikolaus 2011). Thus, fetish markets are different from bushmeat markets in scope and type of traded animals, given that the latter ones serve the scope of domestic consumption for food (e.g., Fa et al. 2003; van Vliet et al. 2012) whereas the former ones are more tightly linked to perceived magic and traditional cultural practices (Taylor and Fox 1992).

Traditional medicine and fetish beliefs are important for the culture of African people, especially in the central (Gilli 1987; Pauwels et al. 2003), southern (de Surgy 1993; Whiting et al. 2011), and western (Adeola 1992; Fretey et al. 2007) countries where there is a flourishing market of animals and animal parts. Among the many animal taxa observed in these markets (e.g., birds, mammals, amphibians, invertebrates), reptiles are typically present (Simelane and Kerley 1997, 1998; Fa et al. 2003; van Vliet et al. 2012).

In spite of the scattered information found in the available literature on the reptiles species traded, few quantitative studies have been performed on reptiles traded in single fetish markets (but see Fretey et al. 2007). Collection of this type of quantitative data is important in terms of conservation biology because several species of West African reptiles are declining considerably (Luiselli et al. 2007; Reading et al. 2010). For instance, it is important to understand whether particular communities make use of certain groups of organisms, and in which habitats or seasons they catch these animals (Adeola and Decker 1987; Edwards 2003; Willcox and Nambu 2006).

In this paper, we quantify the reptile species

traded in a single fetish market of West Africa. We studied the “Marché au Fétiches” (French for fetish market) situated in Lomé, the capital city of Togo. This market is particularly interesting, compared to other similar marketplaces in West African countries, because it is considerably larger in size (thus including a higher number of specimens traded) and because it is situated in a town surrounded by areas with different vegetation types (Guinea savannah, forest, coastal sites, etc.; Ern 1979) that may influence the types of reptiles captured.

### MATERIALS AND METHODS

The fetish market is situated in Akodessewa, in the east of Lomé, Togo. The market was moved to the present site at the end of the 1990s, with the purpose of creating a dedicated venue for selling traditional medicine away from the main Bè market. This is the most famous fetish market of West Africa because it offers a large choice to customers who come looking for the ingredients of sorcerer’s and traditional healers’ prescriptions.

We surveyed the market place three times. First, one of the authors (LL) conducted a preliminary survey in July 2012 to determine the feasibility of this study, with identification of the species traded and with no count of the number of traded specimens (apart from chelonians and pythons whose corpses were counted). Second, we conducted a quantitative survey in December 2012. We examined and counted all of the individual reptile specimens available at the marketplace. The number of individuals traded by species was determined by recording the carcasses, heads, and body parts clearly attributable to different specimens. Third, we conducted another survey by recording of all species traded in February 2013. Counts were simultaneously conducted by four authors, each of us analyzing a distinct portion of the market stands, and overall we spent a total of 34 person-hours of field effort. We could not exclude the possibility that minor errors in determining the exact number of individuals of all species may have occurred. However, we used the most conservative criteria for determining the numbers of individuals, although not all species

would be affected in the same way by this approach. For instance, if for a given snake species we found ten different heads and ten different skins of consistent size, then we considered the number of traded specimens to be 10. This conservative approach might have underestimated the number of snakes, whereas for lizards, which were present in the market as whole specimens, the number was likely to be close to the full number of specimens present.

In each of the three surveys, we walked up to the market trader and openly identified corpses and counted skins, heads, and other body parts. We also spoke to the traders in order to obtain more information on the animals traded, including their site of capture if known. In our study market, traders were disinclined to allow people to make notes on their products for fear of interference by government officials, as may happen in other similar marketplaces (Luiselli et al., pers. obs.). For this reason, by explaining our work, we made sure that traders did not hide their products away during surveys.

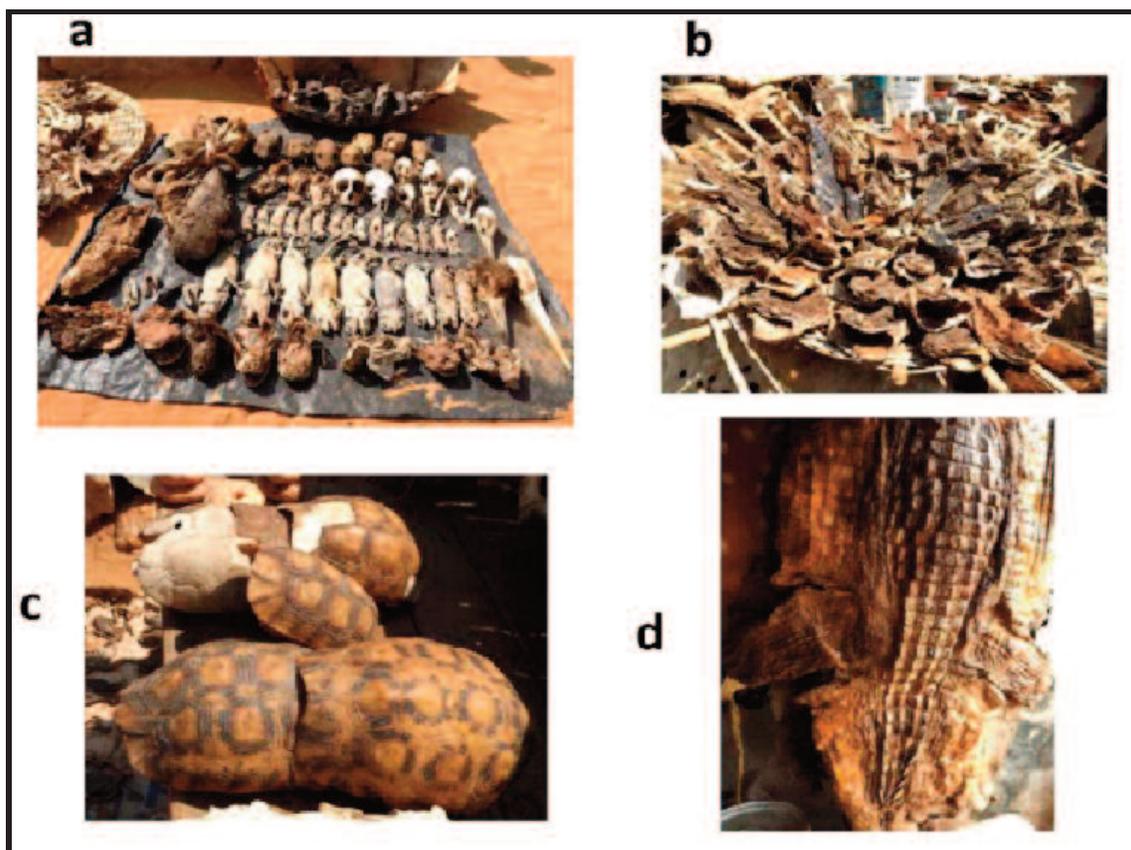
Each specimen was identified to species level (using Chippaux 2006 for snakes, and Trape et al. 2012 for lizards, turtles, tortoises, and crocodiles), although this was not possible for some cases (e.g., *Meizodon* spp.). In addition, given the confused taxonomic status of the genus *Psammophis* (cf. Hughes 1999), we assigned those specimens fitting with ‘*phillipsii*’ or ‘*sibilans*’ according to the identification keys of Chippaux (2006). Some species were recently subjected to splitting, with West African populations being considered distinct taxa from other African populations. This was the case, for instance, of *Bitis gabonica* to *Bitis rhinoceros* (Lenk et al. 1999), *Kinixys belliana* to *Kinixys nogueyi* (Lataste 1886; Rhodin et al. 2012), and *Crocodylus niloticus* to *Crocodylus suchus* (Schmitz et al. 2003). Here we maintain both nomenclatures, placing the ‘old’ taxon in parentheses (e.g., *Kinixys (belliana) nogueyi*). Where assessed, the International Union for Conservation of Nature (IUCN) status of the each species was noted (IUCN Red List of Threatened Species. Available from <http://www.iucnredlist.org> [Accessed 21 December 2012]). Each species observed in the market was also assigned to a pertinent

vegetation zone based on its distribution range across West Africa. Maps used for this assignment were taken from IUCN 2012 (*op. cit.*) when available, or from Chippaux (2006) and Trape et al. (2012) in all other cases. The territory of Togo was subdivided into five main vegetation zones (Ern 1979): (1) northern plains (= transition area between Sudanese-Sahelian savannahs); (2) hilly dry woodlands and savannah mosaics (Sudanese savannah); (3) Guinean savannah; (4) Togo mountains forests (= semi-deciduous moist forest); and (5) southern coastal plain. In our case, we simplified this categorization by condensing vegetation zones (1) and (2) into the novel category 'dry savannah' because both of these zones were basically belonging to the Sudanese savannah

region according to White (1963). Thus, the following vegetation zone categories were considered for our analyses: (1) dry savannah, (2) Guinean savannah; (3) forest; (4) marine/coastal; and (5) generalist (when more than two vegetation zones were inhabited per given species).

## RESULTS

In total, 1,765 individual reptiles, belonging to 37 different species, were observed (Table 1; Fig. 1). Sea turtles were traded as heads or shells, tortoise and freshwater turtles were dried entire specimens or shells, and snakes were either heads, skins, or dried specimens. Snake bones were also observed, but in these cases the species remained unidentified. Lizards were dried entire



**FIGURE 1.** Examples of the reptile species displayed for sale at the fetish market of Lomé, Togo. Chameleons, and especially *Chamaeleo senegalensis*, dominated among the reptiles species traded (a). Among snakes, the Puff Adder (*Bitis arietans*) was the most heavily traded species (b). In this photo, together with many Puff Adder heads, there are also some heads of the Forest Cobra (*Naja melanoleuca*). Tortoises were not heavily traded, but *Kinixys (belliana) nogueyi* was the most commonly traded species (c). Skins of crocodiles were also observed in the market (d). Photo d shows *Crocodylus (niloticus) suchus*. All photos by Aurélie Aïdam.

**TABLE 1.** Number and species identity of reptile specimens censured at the Fetish market, Lomé in December 2012, including their main habitat/vegetation zone of origin. Nomenclature follows Chippaux (2006) for snakes, and Trape et al. (2012) for lizards, turtles, tortoises, and crocodiles.

Species name	Common name	No. in market	Forest	Guinea savannah	Dry savannah	Marine/coastal
<b>Crocodylians</b>						
<i>Crocodylus (niloticus) suchus</i>	West African Nile Crocodile	54	1	1	1	0
<i>Mecistops (=Crocodylus) cataphractus</i>	African Slender-snouted Crocodile	1	1	0	0	0
<b>Testudines</b>						
<i>Pelomedusa subrufa</i>	African Helmeted Turtle	2	0	1	0	0
<i>Pelusios castaneus</i>	Western Hinged Terrapin	27	0	1	0	0
<i>Centrochelys (= Geochelone) sulcata</i>	African Spurred Tortoise	2	0	0	1	0
<i>Kinixys (belliana) nogueyi</i>	Bell's Hinged Tortoise	16	0	1	0	0
<i>Kinixys homeana</i>	Home's Hinged Tortoise	1	1	0	0	0
<i>Kinixys erosa</i>	Forest Hinged Tortoise	4	1	0	0	0
<i>Lepidochelys olivacea</i>	Olive Ridley Sea Turtle	6	0	0	0	1
<i>Chelonia mydas</i>	Green Sea Turtle	1	0	0	0	1
<i>Dermochelys coriacea</i>	Leatherback sea turtle	1	0	0	0	1
<i>Trionyx triunguis</i>	Nile Soft-shelled Terrapin	2	1	0	0	1
<i>Cyclanorbis senegalensis</i>	Senegal Flapshell Terrapin	1	0	1	0	0
<b>Sauria</b>						
<i>Agama agama</i>	Common Rainbow Lizard	128	1	1	1	0
<i>Chamaeleo gracilis</i>	Graceful Chameleon	29	1	1	0	0
<i>Chamaeleo senegalensis</i>	Senegal Chameleon	963	0	1	1	0
<i>Trachylepis perrotetii</i>	Spotted Savannah Skink	6	0	1	0	0
<i>Varanus ornatus</i>	Ornate Monitor	1	1	0	0	0
<i>Varanus niloticus</i>	Nile Monitor	31	0	1	0	0
<i>Varanus exanthematicus</i>	Western Savannah Monitor	9	0	0	1	0
<b>Serpentes</b>						
<i>Python sebae</i>	African Rock Python	28	1	1	0	0
<i>Python regius</i>	Ball Python	16	1	1	0	0
<i>Toxicodryas blandingii</i>	Powdered Tree Snake	6	1	0	0	0
<i>Psammophis cf. phillipsii</i>	Olive Whip Snake	25	1	0	0	0
<i>Psammophis cf. sibilans</i>	Short-snouted Sand Snake	12	0	1	1	0
<i>Thelotornis kirtlandii</i>	Forest Vine Snake	1	1	0	0	0
<i>Philothamnus irregularis</i>	Irregular Green Snake	11	1	1	0	0
<i>Hapsidophrys smaragdina</i>	Emerald Snake	1	1	0	0	0
<i>Lamprophis fuliginosus</i>	Brown House Snake	3	1	1	0	1
<i>Meizodon sp.</i>	Crowned Snake	1	0	1	1	0
<i>Rhamphiophis oxyrhynchus</i>	Western Beaked Snake	21	0	1	1	0
<i>Dasypeltis gansi</i>	Gans' Egg-eating Snake	1	0	1	1	0
<i>Naja melanoleuca</i>	Forest Cobra	34	1	1	0	0
<i>Naja nigricollis</i>	Spitting Cobra	5	1	1	0	1
<i>Dendroaspis viridis</i>	West African Green Mamba	4	1	0	0	0
<i>Bitis arietans</i>	Puff Adder	257	0	1	1	1
<i>Bitis (gabonica) rhinoceros</i>	Gaboon Viper	21	1	0	0	0
Undetermined		33				
<b>TOTAL</b>		<b>1,765</b>	<b>16</b>	<b>16</b>	<b>8</b>	<b>4</b>

specimens.

There was an uneven distribution of number of species in terms of their main habitat of origin, with the great majority of species coming from two vegetation zones (forest and Guinea savannah; Table 1). Species from dry savannah, generalist, and marine/coastal species were under-represented in the sample. The majority of specimens traded were Guinean savannah species (79.2%), compared with forest species (11.4%; Table 1). In this case, savannah specimens were clearly more traded than specimens from any other vegetation zone.

Chameleons (*Chamaeleo senegalensis*) were by far the most intensively traded reptiles, accounting for nearly 55% of the total number of reptiles examined (Table 1). These chameleons are typically savannah inhabitants (Chirio and LeBreton 2007; Trape et al. 2012). The second most commonly traded species was the Puff Adder (*Bitis arietans*), also a savannah species (Chippaux 2006; Chirio and LeBreton 2007).

In terms of IUCN conservation status, one species was Critically Endangered (the Leatherback Sea Turtle, *Dermochelys coriacea*), one was Endangered (the Green Sea Turtle, *Chelonia mydas*), three were Vulnerable (African Spurred Tortoise, *Centrochelys* (= *Geochelone*) *sulcata*; Home's Hingeback Tortoise, *Kinixys homeana*; and Olive Ridley Sea Turtle, *Lepidochelys olivacea*), and one was Lower Risk/Near Threatened (Senegal Flapshell Turtle, *Cyclanorbis senegalensis*). All other species were either not listed, Least Concern, or Data Deficient.

## DISCUSSION

Overall, our study revealed that a high number of reptile individuals, from a varied diversity of species, are currently traded in the Lomé fetish market. The number of reptiles species identified in this study ( $n = 37$ ) is not comparable to that identified in a previous survey of the same marketplace (Taylor and Fox 1992) because Taylor and Fox reported only the presence of such general groups as crocodiles, snakes, sea turtles, turtles, and chameleons. The reptiles observed in the present surveys were mainly

from the Guinean savannah habitat, which is the predominant vegetation type just around Lomé and in most part of Togo (Ern 1979). Therefore, we suggest that the majority of the specimens used for the traditional medicine and fetish were collected opportunistically close to the site where they were actually marketed. For instance, in the February 2013 survey, we observed 22 freshly killed (not yet dried) snake corpses (7 *Naja nigricollis*, 12 *Bitis arietans*, 3 *Psemmophis cf. phillipsii*) that, according to their sellers, were captured along the eastern peripheral side of Lomé. However, there were certainly exceptions to this rule. For instance, a specimen of the tortoise *Centrochelys sulcata* was present in the market despite being absent from Togo (Trape et al. 2012), and we also observed in the Lomé market the skin of a Lion (*Panthera leo senegalensis*) which was reportedly originating from Pendjari Biodiversity Reserve (Benin). However, both giant tortoises and lions are charismatic animals for the local cultures (Schaller 1972; Chardonnet 2002; Branch 2007) and it is not surprising that the demand can be so high for such species that collectors may make long displacements to bring them to the marketplace. All the other species of traded reptiles are known to occur in Togo and in the surrounding area of Ghana (Hughes and Barry 1969; Leaché 2005) and Benin (Leaché et al. 2006; Segniagbeto 2009; Ullenbruch et al. 2010; Segniagbeto et al. 2011). Concerning *Centrochelys sulcata*, although no natural populations are currently known in Togo (Branch 2007), this species is ranched in southern Togo for the international pet trade export (Ineich 2011), Togo being the main export country for Africa (Convention of International Trade on Endangered Species. 1980. CITES database analysis. Available from <http://www.cites.org/eng/resources/species.html> [Accessed September 2012]).

It is noteworthy that, at least for some species, there is a tight link between the bushmeat market and the fetish market (Fa et al. 2003). For instance, some of the larger animals are mainly sold in parts (crocodiles, pythons, large chelonians), with the meat being used for the food trade and the bones, heads or skins being used for fetish purposes. This potential link

between bushmeat and fetish markets should be explored more in depth by further studies. Certainly, the use of reptile body parts (fat, skull, bone, organs, and blood) is very specific for fetish practices, as each body part is considered to be essential in traditional pharmacopoeia for various diseases (e.g., convulsions, malaria, fever, HIV-AIDS, liver problems, tetanus, induce vomiting, etc.), although of course no scientific evidence of any benefit from these animal parts has ever been demonstrated in the medicinal literature. Specific body parts are also used for additional reasons other than healthcare. For instance, many businessmen in Togo believe that appropriate animist ceremonies using reptile body parts can help them to improve their activities, and to this purpose they come regularly to ask the advice of a voodoo priest in this market. It is also common to see reptilian body parts in the small statuettes of voodoo in the fetish markets.

Most of the reptile species observed in the market are of lesser international conservation concern, while those of high conservation concern were observed in very low numbers (e.g., sea turtles: *Dermochelys coriacea* and *Chelonia mydas*). It is possible that the scarcity of threatened species in the market may reflect their disappearance in the field, as already demonstrated to occur in bushmeat markets where the species threatened by hunting always become rare in markets after the maximum sustainable yield has been overshoot (Cowlishow et al. 2005). In addition, some of the traded species are declining locally or even regionally (e.g., *Kinixys homeana* and *Kinixys erosa*, Luiselli 2003a, 2003b; Luiselli et al. 2006; *Python sebae*, Luiselli et al., 2007; *Python regius*, Reading et al. 2010; and *Mecistops (Crocodylus) cataphractus*, Chirio and LeBreton 2007; Shirley 2010), and the overall IUCN Red List assessment for many of these species is currently in preparation. The trade of these declining species warrants monitoring by competent agencies, with special attention on whether any type of cross-border trade (e.g., from Ghana and Benin) might occur to refurbish the Lomé fetish market. Indeed, during the '70s and '80s, Lomé was well-known for selling (and even exporting to Europe) many reptile

specimens which were originally captured in Ghana (Laurent Chirio and Barry Hughes, pers. comm. to LL), and it is possible that such an international trade may still occur on some extent (Ineich 2011).

Despite being utilized for fetish purposes, several of the reptile species recorded in the Lomé market are legally protected in Togo under Article 62, Section 2, Chapter II of the law N° 2008-005, regulating environment protection and wildlife conservation. This is the case for the four marine turtle species (*Dermochelys coriacea*, *Lepidochelys olivacea*, *Chelonia mydas*, and *Eretmochelys imbricata*), for all of the freshwater turtles and tortoises, for crocodiles, and for *Python sebae*. In the practice, however, it is very difficult for the administration in charge of wildlife conservation to implement this law, because most Togolese people think that all reptiles, and in particular snakes, are dangerous (and thus that they should be killed), and/or are useful as meat and for traditional medicine. Indeed, marine turtles, freshwater turtles, tortoises, African Rock Pythons and monitor lizards are considered as game and are systematically hunted (Segniagbeto et al., pers. obs.).

A shortcoming of this study is that we provided only a snapshot of the current reptiles traded as fetish in Togo because we surveyed the market for only a short time span. For instance, the number and even the species of traded chelonians varied between the first and the second survey (see the data concerning the number of chelonians recorded in the first survey in Luiselli et al. (In press). Therefore, longitudinal monitoring of the reptiles traded in the Lomé fetish market may allow much more detailed understanding of the trade dynamics of the targeted species. In addition, research on fetish markets, as with research on bushmeat markets, should aim to understand: (1) the history of the trade; (2) the perspectives of those involved; (3) the socio-economic background of the marketplace and community; (4) the biotic background of the specimens; and (5) the spatial and temporal patterns of species being traded. This information is crucial to make appropriate assessments and decisions on how to manage these markets for the interests of people and

wildlife alike.

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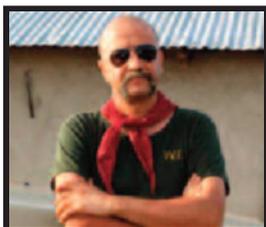
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