CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Seventeenth meeting of the Conference of the Parties
Johannesburg (South Africa), 24 September – 5 October 2016

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Inclusion of the African pygmy chameleons of the genera *Rhampholeon spp. and Rieppeleon spp.* in Appendix II.

These taxa have undergone frequent taxonomic changes and were originally all included in the genus *Rhampholeon*. Recent taxonomic revisions divide these chameleons into two genera, *Rhampholeon* and *Rieppeleon* (Matthee *et al.* 2004; Tilbury 2010); while in trade the old taxonomy is still dominant.

Listing in accordance with Article II, Paragraph 2a, of the Convention, and Resolution 9.24 (Rev. CoP14) Annex 2a, Paragraph B, for

Rhampholeon acuminatus	(Mariaux & Tilbury 2006)
Rhampholeon nchisiensis	(Loveridge 1953)
Rhampholeon spectrum	(Buchholz 1874)
Rhampholeon temporalis	(Matschie, 1892)
Rhampholeon uluguruensis	(Tilbury & Emmrich 1996)
Rhampholeon viridis	(Mariaux & Tilbury 2006)
Rieppeleon brevicaudatus	(Matschie 1892)
Rieppeleon kerstenii	(Peters 1868)

and in accordance with Article II, Paragraph 2b, of the Convention, and Resolution Conf. 9.24 (Rev. CoP 14), Annex 2b, Paragraph A, for

Rhampholeon gorongosae	(Broadley 1971)
Rhampholeon marshalli	(Boulenger 1906)
Rhampholeon beraduccii	(Mariaux & Tilbury 2006)
Rhampholeon boulengeri	(Steindachner 1911)
Rhampholeon bruessoworum	(Branch *et al.* 2014)
Rhampholeon chapmanorum	(Tilbury 1992)
Rhampholeon hattinghi	(Tilbury & Tolley 2015)
Rhampholeon maspictus	(Branch *et al.* 2014)
Rhampholeon moyeri	(Menegon *et al.* 2002)
Rhampholeon nebulauctor	(Branch *et al.* 2014)
Rhampholeon platyceps	(Günther 1892)
Rhampholeon tilburyi	(Branch *et al.* 2014)
Rieppeleon brachyurus	(Günther 1892)

Rhampholeon spinosus is already listed in CITES Appendix II under its old name *Bradypodion spinosum*.

B. Proponent

Kenya[*]:

C. Supporting statement

1. Taxonomy

1.1 Class: Reptilia

1.2 Order: Squamata

1.3 Family: Chamaeleonidae, subfamily: Brookesiinae

1.4 Genus, species (subspecies):

Rhampholeon (Bicuspis) gorongosae		(Broadley, 1971)
Scientific synonyms:		*Rhampholeon marshalli gorongosae* (Broadley, 1971)
Common names:	English:	Mount Gorongosa pygmy chameleon
Rhampholeon (Bicuspis) marshalli		(Boulenger, 1906)
Scientific synonyms:		*Rhampholeon marshalli* (Boulenger, 1906), *Chamaeleo (Bicuspis) marshalli* (Loveridge, 1951), *Rhampholeon marshalli marshalli* (Broadley, 1971)
Common names:	English:	Marshall's pygmy chameleon, Marshall's African leaf chameleon, Marshall's stump-tail chameleon
Rhampholeon (Rhampholeon) spectrum		(Bucholz, 1874)
Scientific synonyms:		*Chamaeleo spectrum* (Bucholz, 1874), *Rhampholeon affinis* (Steindachner, 1911), *Brookesia spectrum* (Mertens, 1938), *Rhampholeon spectrum* (Günther, 1874)
Common names:	English:	Cameroon Stumptail Chameleon, Spectral Pygmy Chameleon, Western Pygmy Chameleon
	Spanish	Camaleón de cola corta, Brookesia espectro, Chamaeleo espectro
Rhampholeon (Rhampholeon) temporalis		(Matschie, 1892)
Scientific synonyms:		*Chamaeleon (Brookesia) temporalis* (Matschie, 1892), *Chamaeleon temporalis* (Werner 1911), *Brookesia temporalis* (Loveridge, 1933), *Rhampholeon temporalis* (Klaver & Böhme, 1986)
Common names:	English:	East Usambara pygmy chameleon, Usambara Stumptail Chameleon
Rhampholeon (Rhampholeon) viridis		(Mariaux & Tilbury, 2006)
Common names:	English:	Pare pygmy chameleon, green pygmy chameleon
Rhampholeon (Rhinodigitum) acuminatus		(Mariaux & Tilbury, 2006)
Common names	English:	Nguru spiny pygmy chameleon, Nguru

[*] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

		Pygmy Chameleon
Rhampholeon (Rhinodigitum) beraduccii		(Mariaux & Tilbury, 2006)
Common names:	English:	Mahenge pygmy chameleon, Beraducci's Pygmy Chameleon
Rhampholeon (Rhinodigitum) boulengeri		(Steindachner, 1911)
Scientific synonyms:		*Brookesia spectrum boulengeri* (Loveridge, 1942, 1957), *Rhampholeon spectrum boulengeri* (de Witte, 1955)
Common names	English:	Boulenger's pygmy chameleon
Rhampholeon (Rhinodigitum) bruessoworum		(Branch *et al*., 2014)
Common names:	English:	Mount Inago Pygmy Chameleon
Rhampholeon (Rhinodigitum) chapmanorum		(Tilbury, 1992)
Scientific synonyms		*Rhampholeon chapmani* (Tilbury, 1992), *Brookesia chapmanorum* (Klaver & Böhme, 1997)
Common names	Malawi:	Dukuduku (chiChewa)
	English:	Chapman's pygmy chameleon
Rhampholeon (Rhinodigitum) hattinghi		(Tilbury & Tolley 2015)
Common names		
Rhampholeon (Rhinodigitum) maspictus		(Branch *et al*., 2014)
Common names:	English:	Mount Mabu Pygmy Chameleon
Rhampholeon (Rhinodigitum) moyeri		(Menegon, Salvidio &Tilbury, 2002)
Common names:	English:	Udzungwa pygmy chameleon, Moyer's Pygmy Chameleon
Rhampholeon (Rhinodigitum) nchisiensis		*(*Loveridge, 1953)
Scientific synonyms:		*Brookesia nchisiensis* (Loveridge, 1953), *Rhampholeon nchisiensis* (Klaver & Böhme, 1986)
Common names:	Malawi:	Nifwi (ChiTumbuka); Tanzania: Wingiruli (Kikinga), Haniula (Kisufi), Kitumbasagesi (Kinyakusa)
	English:	Nchisi pygmy chameleon, blue-eyed/pitless pygmy chameleon, South African Stumptail Chameleon
Rhampholeon (Rhinodigitum) nebulauctor		(Branch *et al*. 2014)
Common names:	English:	Mount Chiperone pygmy chameleon
Rhampholeon (Rhinodigitum) platyceps 2 subspecies, *R. platyceps platyceps* and *R. platyceps carri,* are discussed		(Günther, 1892)
Scientific synonyms:		*Rhampholeon platyceps (*Günther, 1892), *Brookesia platyceps (*Loveridge, 1933), *Brookesia platyceps platyceps* (Loveridge, 1953), *Brookesia platyceps carri* (Loveridge, 1953)
Common names:	Malawi:	Nmandondo (CHiChewa/Nyanja)
	English:	Mount Mulanje pygmy chameleon, Malawi Stumptail Chameleon
Rhampholeon (Rhinodigitum) tilburyi		(Branch *et al*. 2014)
Scientific synonyms:		
Common names:	English:	Mount Namuli pygmy chameleon

Rhampholeon (Rhinodigitum) uluguruensis		(Tilbury & Emmrich, 1996)
Scientific synonyms:		*Rhampholeon uluguruensis* (Tilbury & Emmrich, 1996)
Common names:	English:	Uluguru pygmy chameleon
Rieppeleon brachyurus		(Günther 1892)
Scientific synonyms:		*Brookesia brachyura brachyura* (Loveridge 1951)*, Brookesia brachyuran ionised* (Loveridge 1951)*, Rhampholeon brachyurus* (Klaver & Böhme 1986)
Common names	Tanzania:	Kitoga (Ngindo), Kipande (Kiyao)
	English:	Zomba Pygmy Chameleon
Rieppeleon brevicaudatus		(Matschie, 1892)
Scientific synonyms:		*Rhampholeon boetttgeri* (Pfeffer 1893)*, Rhampholeon brevicaudatus* (Werner 1911)*, Brookesia brevicaudata* (Loveridge 1942)
Common names:	Tanzania:	Lwivi (Kikami), Luvi (Kisumbara)
	English:	Bearded Pygmy Chameleon
Rieppeleon kerstenii comprises of 2 subspecies, *Rieppeleon kerstenii kerstenii* and *Rieppeleon kerstenii robecchii*		(Peters, 1868)
Scientific synonyms		*Brookesia kerstenii* (Loveridge, 1936)*, Chamaeleo kerstenii* (Peters, 1868)*, Rhampholeon kerstenii* (Günther, 1880)
Common names	Kenya:	Kanakalumbwe (Giriama), Ngati (Kikamba)
	English:	Bearded Pygmy Chameleon, Kenya Pygmy Chameleon, Kenya Stumptail Chameleon, Kersten's Dwarf Chameleon

1.7 Code numbers: none

2. Overview

- African pygmy chameleons are the only chameleons not yet covered by CITES. All other chameleons are listed in CITES Appendix II (except *Brookesia perarmata* listed in Appendix I). International trade in *Rhampholeon* and *Rieppeleon* is neither monitored nor regulated. The only exception is *Rhampholeon* spinosus, which is already listed in CITES Appendix II under its former name *Bradypodion spinosum*. This species is classified in the IUCN Red List 2014 as Endangered (Mariaux 2010b) and is now increasingly found in shipments of wild caught "assorted pygmy chameleons", which further impairs this species' precarious situation (Anderson 2011).

- Since 2002 nine new *Rhampholeon* species were described, one in 2002 (Menegon *et al.* 2002), three in 2006 (Mariaux & Tilbury 2006), four in 2014 (Branch *et al*. 2014) and one in 2015 (Tilbury & Tolley 2015). Further multiple cryptic taxa are assumed for the *R. moyeri/R. uluguruensis* complex (Fisseha *et al*. 2013). With this new taxonomy distribution range of distinct species, e.g. of the *Rhampholeon platyceps* complex, is much more limited than originally assumed and former assessments for wild populations of pygmy chameleons must be reconsidered.

- At present, the IUCN Red List (2014) includes 18 out of 19 *Rhampholeon* species: four species as Critically Endangered, four as Endangered, three as Vulnerable, six as Least Concern and one as Near Threatened – However, other experts consider an even higher status for at least three Rhampholeon species (Hjarding *et al*. 2014). *Rhampholeon hattinghi* has only been described in 2015 (Tilbury & Tolley 2015) and has yet not been assessed by IUCN.

- Compared to the large bodied and more colourful genera African pygmy chameleons have long been spared from large scale exploitation for the international pet trade. However, meanwhile, obviously in reaction to trade restrictions for some other chameleon taxa, pygmy chameleons are now commonly offered in the international pet trade. US import numbers alone reached in some years more than 20,000 specimens (see Annex).

- In 2004, three former *Rhampholeon* species have been assigned to the new genus of *Rieppeleon* (Matthee *et al*. 2004). However, in international trade they are still offered and recorded under the old taxonomy.

- Within the period 2001-2014, the USA alone imported 185,533 pygmy chameleons under the taxonomy Rhampholeon, with at least 98.3% of them being taken from the wild and 99.5% destined for commercial trade. Of these imports 104,721 were *Rieppeleon kerstenii* (imported as "*Rhampholeon kerstenii*"), 61,785 *R. brevicaudatus* (imported as "*Rhampholeon brevicaudatus*"), 11,293 unidentified "*Rhampholeon* species", 6,392 *R. spectrum*, 497 *Rieppeleon brachyurus* (imported as *Rhampholeon brachyura*), 398 *Rhampholeon uluguruensis*, 244 *Rhampholeon viridis* and 203 *R. acuminatus* (US LEMIS Database 2015). Across Europe, *Rhampholeon* and *Rieppeleon* are offered by many internet traders and specialised pet shops.

- In the IUCN Red List (2014) it is stressed that "population declines are inferred as a result of direct exploitation, which is currently poorly regulated due to confusion in CITES implementation" (Tolley & Menegon 2014a). The ongoing mix-up of nomenclature in trade, a considerable amount of unspecified trade records ("*Rhampholeon* sp.") and the fact that pygmy chameleon species very much look-alike (e.g. Mariaux & Tilbury 2006) are strong arguments for a listing of both genera. Not only for non-experts but even for traders African pygmy chameleons are hard to distinguish and to identify correctly, as wrong-labelling in trade indicates (Tolley 2014; Tolley & Menegon, 2014 a,b; Hildenhagen 2007, 2005).

- The main export country is Tanzania, followed by Equatorial Guinea, Cameroon and Guinea (US LEMIS Database 2015).

- 15 out of the 19 *Rhampholeon* species are endemic, several species have a small distribution range or are even point endemic (Tilbury & Tolley 2015; Branch *et al.* 2014; Burgess *et al.* 2007; Mariaux & LeBreton 2010; Tilbury 2010).

- African pygmy chameleons have a low reproduction rate, with a clutch size of only 1-12 eggs (Gostner 2009; Hildenhagen 2007; Coevoet 2007; Akani *et al.* 2001).

3. Species characteristics

3.1 Distribution

15 out of the 19 *Rhampholeon* species are endemic, while *Rieppeleon* species are wider distributed.

Rhampholeon acuminatus is endemic to the Nguru Mountains, Tanzania (Nguru south and Kanga forests) (Tilbury 2010; Menegon *et al.* 2008).

R. beraduccii is only known from a single small mountain forest patch of 17 km², Mahenge Mountain, Tanzania (Tilbury 2010, IUCN 2014).

R. boulengeri is native to Burundi, DRC, Kenya, Rwanda, Tanzania and Uganda. In DRC this species occurs in north Kivu district, south Kivu district, Ituri forest, Idjwi Island-Lake Kivu. In Kenya it is found in Kakamega, north Nandi escarpment forest, Cherengeni Hills. In Tanzania this species has been recorded in Minziro forest (Tilbury 2010).

R. bruessoworum is limited to a small remnant, heavily fragmented, patch of mid-altitude Afrotemperate forest on Mt. Inago, Mozambique (Branch *et al.* 2014).

R. chapmanorum: only found at Malawi Hill (Natundu Hills) (Tilbury 2010, IUCN 2014).

R. gorongosae: endemic to the montane forest on Gorongosa Mountain, Mozambique (Tilbury 2010).

R. hattinghi is described from an isolated montane forest remnant situated toward the southern end of the Albertine Rift bordering Lake Tanganyika, Democratic Republic of Congo (Tilbury & Tolley 2015).

R. marshalli: is found only in the forest fragments in the Eastern Highlands of Zimbabwe and adjacent Mozambique (Tilbury 2010). Although this area stretches over almost 4,500 km², but based on GoogleEarth satellite imagery only ca. 540 km2 of forest remains (IUCN 2014).

R. maspictus is restricted to an intact 79 km² patch of Afrotemperate forest on the slopes of Mount Mabu, Mozambique (Bayliss *et al*. 2014, Branch *et al*. 2014).

R. moyeri is endemic to Tanzania, where it occurs in Mahenge, the eastern scarp forests of the Udzungwa Mountains, as well as in the Rubeho Mountains (IUCN 2014; Tilbury 2010).

R. nchisiensis is native to Malawi, Tanzania and Zambia. In Malawi it has been recorded in Nchisi Forest, Matipa Forest, Misuku Mountains (Mughese Forest) and Nyika Plateau. In Tanzania it occurs in the Ukinga Mountains, Poroto Mountains, Rungwe Mountain, Owembe Forest and Kipengere Range. In Zambia it is found in the Nyika Plateau (Tilbury 2010).

R. nebulauctor is endemic to a small forest patch on Mount Chiperone, Zambézia Province, northern Mozambique (Branch *et al*. 2014).

R. platyceps is native to Malawi. It occurs in Mount Mulanje and Mchese Mountain (Tilbury 2010). Former assumption that its distribution would include Chipperone Mountain, Mozambique, was shown to be wrong (Branch *et al.* 2014).

R. spectrum is the only species occurring on the western side of the continent; native to Cameroon (e.g. Takamanda region, Mt. Cameroon), Equatorial Guinea (Bioko and mainland), Gabon, Nigeria (Oban Hills, Calabar district) (Tilbury 2010; Gonwouo 2007; LeBreton 2004).

R. spinosus occurs in the East and West Usambara Mountains, Tanzania in montane forest above 700 m asl. The combined area of forest fragments where the species is known to occur is 567 km² (IUCN 2014; Tilbury 2010).

R. temporalis is endemic to Tanzania: North Pare Mountains and South Pare Mountains, Eastern Usambara Mountains and Magrotto Hill (Tilbury 2010).

R. tilburyi is endemic to the evergreen Afrotemperate forest patches of Mount Namuli, Zambezia Province, Mozambique (Branch *et al*. 2014).

R. uluguruensis is confined to the Uluguru Mountains (and the small Mkungwe outcrop just 18 km east of this range) in Tanzania. Known forest patches where the species is known to occur cover an area of 278 km² (Fisseha *et al*. 2013).

R. viridis is native to Tanzania (endemic to Eastern Ark), in the North Pare Mountains and the South Pare Mountains. There is currently one record in the Mazumbai Forest reserve (Tilbury 2010).

Rieppeleon brachyurus is native to Malawi (east of the Shire River), eastern Tanzania (including Nguru Mountains) and northern Mozambique (Tilbury 2010; Menegon *et al.* 2008).

R. brevicaudatus is native to Tanzania (including Nguru Mountains) and Kenya (Shimba Hills) (Tilbury 2010; Menegon *et al.* 2008).

R. kerstenii is native to Somalia, eastern Ethiopia, Kenya and northeastern Tanzania (IUCN 2014; Tilbury 2010).

3.2 Habitat

Most species of pygmy chameleons are restricted to wet indigenous forests, at least six species are restricted to isolated hills and mountain massifs (Tilbury 2010). Rhampholeon is mostly a montane genus, while Rieppeleon is primarily a lowland taxon (Mariaux & Tilbury 2006).

Rhampholeon acuminatus inhabits Afro-montane rainforest between 1,500-1,600 meters a.s.l. (Tilbury 2010).

R. beraduccii inhabits submontane rainforest around 1,000 meters a.s.l. (Tilbury 2010).

R. boulengeri inhabits deep forests. The species has a large area of distribution in East Africa (Tilbury 2010).

R. bruessoworum is restricted to mid-altitude Afrotemperate forests (Branch *et al*. 2014).

R. chapmanorum lives in lowland seasonal rain forest with an average rainfall of 1,500mm and a mean annual temperature of 21-24°C (Tilbury 2010).

R. gorongosae lives in sub-montane evergreen forest at 1,000-1,800 m a.s.l. (Tilbury 2010).

R. hattinghi:

R. marshalli is restricted to the underground and leaf litter of the floor of sub-montane and montane evergreen wet forests at 1,000-1,800 m a.s.l. (Mariaux 2010). Specimens may leave the shelter of the forest and penetrate surrounding bush and grassland (Tilbury 2010).

R. maspictus is considered a forest specialist, which is restricted to Afrotemperate forests (Branch *et al*. 2014).

R. moyeri is strictly confined to escarpment forests between altitudes of 1000-2000m a.s.l. with high rainfall (Tilbury 2010; Burgess *et al.* 2007).

R. nebulauctor: moist Afrotemperate forest between about 900-1,900 m (Branch *et al*. 2014).

R. nchisiensis is a montane forest living species found at elevations up to 2400m a.s.l. It inhabits the lower forest strata (Tilbury 2010).

R. platyceps lives in cool sub-montane seasonal rain forest from its lower fringe to the riparian scrub and montane forests between 1000-1800m a.s.l. (Tilbury 2010).

R. spectrum lives in wet forests with more than 1,600 mm of rain per annum with closed canopy (primary as well as mature secondary forests (Tilbury 2010). A preference for montane areas above 500 meters has been documented, while it can be found at up to 1,900 m a.s.l. During daylight it was always observed on the ground, whereas it was observed on low bushes at night-time (Akani *et al*. 2001). The species is dependent upon the forest biome and does not appear to adapt well to degraded forest habitats.

R. spinosus inhabits montane forest above 700 m asl (Tilbury 2010).

R. temporalis is depending on evergreen sub-montane rain forests between 900-1,500 meters a.s.l. They inhabit deep forests and forests fringes and seem to have a rather sporadic distribution (Tilbury 2010; Burgess *et al.* 2007).

R. tilburyi depends on evergreen dry Afrotemperate forest patches, 1,600 -2,200 m (IUCN 2014).

R. uluguruensis strictly depends on sub-montane to montane closed canopy evergreen forest, 1,500-2,000 meters a.s.l. The annual rainfall here is between 800-2,000mm, the canopy is 20-30 meter high with emergent trees (Tilbury 2010; Burgess *et al.* 2007).

R. viridis is an inhabitant of typical Afro-Montane evergreen rain forests at 1,400-2,070 meters a.s.l. They depend on deep forest and forest fringes (Tilbury 2010; Doggart *et al*. 2008).

Rieppeleon brachyurus inhabits moist woodland which may extend into grasslands. May also be found in riparian and gallery forests in the Shire Highlands and around the lower slopes of Zomba mountain but is excluded from the higher level forests. In Tanzania, it has also penetrated into the sub-montane forests on the Rondo plateau (Tilbury 2010).

R. brevicaudatus occurs in lowland forest to sub-montane forest from sea level to about 1,200 meters a.s.l. (Tilbury 2010).

R. kerstenii, unlike other pygmy chameleons, has adapted to life outside evergreen forests. It inhabits a variety of biotopes from dense evergreen forests, coastal thickets, savannah woodland and grasslands to arid semi-desert regions (Tilbury 2010).

3.3 Biological characteristics

All pygmy chameleons are diurnal and mainly ground-living or in height of about 0.5 meter (Patrick *et al.* 2011). At night, they climb up to a few feet off the ground into the lower undergrowth and shrubs to escape terrestrial nocturnal predators (Tilbury 2010, Akani *et al.* 2001).

Sexually mature males engage in an aggressive combat display towards rival males by assuming a species specific pattern and brighter colours. In many species an intermittent buzzing vibration has been noticed. This buzzing may be elicited when picking the chameleons up, and/or touching them on their backs (Tilbury 2010).

All pygmy chameleons are oviparous, with a low reproduction rate. Several clutches of eggs may be laid per year in holes dug in leaf litter, soil and occasionally under logs and stones (Tilbury 2010). For *R. spectrum* a clutch size of 2-5 eggs has been reported, for *R. acuminatus* 4 eggs, for *R. boulengeri* 1-3 eggs, for *R. uluguruensis* 3 eggs, for *R. moyeri* 5 eggs; for *R. viridis* 4-5 eggs, for *R. chapmanorum* 8 eggs, for *R. gorongosae* up to 11 eggs, for *R. nchisiensis* 8-12 eggs (Tilbury 2010; Gostner 2009; Hildenhagen 2007; Coevoet 2007; Akani *et al*. 2001). Hatching in the wild was observed after 35 days for *R. marshalli* (Tilbury 2010); while in captivity hatching time is obviously prolonged: in *R. viridis* and *R. nchisiensis* it has been observed only after 77-113 and 60-90 days, respectively (Gostner 2009; Coevoet 2007). It is assumed that two batches of eggs may be laid per

year (Tilbury 2010). Offspring of *R. spectrum* reaches sexual maturity within three months, of *R. nchisiensis* and *R. temporalis* after 9-12 months (Tilbury 2010; Hildenhagen 2007).

3.4 Morphological characteristics

The following descriptions are based on Tilbury (2010), Hildenhagen (2007), and Mariaux & Tilbury (2006): African pygmy chameleons are difficult to identify. They are essentially dwarfed lizards with short, weakly to non-prehensile tails. Coloration consists mainly of comparatively drab grays and browns resembling dead leaves; color pattern is not a consistent character to distinguish the species. All *Rhampholeon* species have two or three diagonal stripes along the flanks running in the anterodorsal to posteroventral direction.

R. acuminatus: total length up to 82 mm (females: body 49 mm, tail 19 mm; males: body 57 mm, tail 25 mm), casque elevated posteriorly, prominent acuminate spines along the lateral edges of the casque, prominent vertically flattened soft oval granulated rostral process in both sexes, temporal crest prominent: fin-like, dorsal crest prominent, an enlarged conical tubercle above the shoulder, dermal pits absent from the groins an axillae, claws biscupid.

R. beraduccii: smallest pygmy: max 36 mm, total length up to 89 mm (females: body 28 mm, tail 8 mm; males: body 23 mm, tail 6 mm), casque flat, cranial crests all weakly developed, rostral process prominent, deep axillary and inguinal dermal pits, claws biscupid, plantar surfaces smooth.

R. boulengeri: total length up to 80 mm (both females and males: body 60 mm, tail 17 mm, Short rostral dermal appendage, crenulated dorsal keel, distinct inter-orbital ridge, axillary pits present, no inguinal pits, smooth to sub-spinous palms and soles, low accessory plantar spines, tail 17-25% of total length.

R. bruessoworum: total length up 50-60 mm, with both sexes having relatively long tails, brownish coloured body (Branch *et al.* 2014; FFI 2014).

R. chapmanorum: total length up to 63 mm (females: body 51 mm, tail 12 mm; males: body 46 mm, tail 16 mm). A short but prominent dermal rostral appendage is present. Dorsal keel crenulated, homogenous granular scalation, distinct inter-orbital ridge, deep axillary and inguinal dermal pits present, palms and soles smooth, accessory plantar tubercles present, claws strongly biscupid,

R. gorongosae: total length max. 105 mm (females: body 71 mm, tail 31 mm; males: body only 30 mm, tail 16 mm); Rostral process present – may be vestigial in females, Top of head flat with no supra-optic peaks, Inter-orbital ridge well defined, Dorsal keel with low clumps of tubercles, A row of enlarged tubercles extends along the lower jaw and lower flank; no axillary or inguinal pits; claws biscupid; soles smooth; males with relatively long rostral process; accessory plantar spines prominent.

R. hattinghi: has a relatively smooth supra-orbital ridge, deep axillary but absent inguinal mite pockets, prominent white spots on the base of the tail and a uniquely derived hemipenal morphology with billowing parasulcal evaginations (Tilbury & Tolley 2015).

R. marshalli: largest pygmy chameleon: total length up to 118mm (females: body 73 mm, tail 45 mm; males: body 60 mm, tail 40 mm); short dermal rostral appendage; no supra-optic peaks; inter-orbital ridge indistinct; sub-mental row of tubercles extends along the lower jaw and side of abdomen; axillary pits usually present; no inguinal pits; soles and palmes smooth; low blunt accessory plantar tubercles; claws strongly biscupid.

R. maspictus: with a total length of up to 80 mm long, the Mount Mabu pygmy chameleon is a relatively large species. Its name comes from the Latin for 'painted man', reflecting the striking green, blue and yellow colouration of breeding males (Branch *et al.* 2014; FFI 2014).

R. moyeri: total length up to 65 mm (females: body 51 mm, tail 12 mm; males: body 43 mm, tail 14 mm). Soft, dermal rostral process present, supra-optic peaks present, average of 15-19 scales between the bases of the peaks, sexes isomorphic, claws strongly biscupid, plantar surfaces smooth, low plantar accessory tubercles, axillary pits present, inguinal pits absent.

R. nchisiensis: total length up to 85 mm (females: body 67 mm, tail 16 mm; males: body 43 mm, tail 13 mm). Rostral appendage present, crenulated vertebral keel, low supra-orbital peaks, distinct inter-orbital ridge, No axillary or inguinal pits, plantar surfaces smooth to sub-spinous, claws markedly bicuspid, accessory palmar/plantar spines present, but reduced, background scalation of homogenous granules.

R. nebulauctor: total length up 40-60 mm; greenish head and forelegs, turquoise to light blue chest, intense orange scales along the top of the tail. It can be distinguished from most other Rhampholeon species by having deep inguinal and axillary pits (Branch *et al.* 2014; FFI 2014).

R. platyceps: total length up to 100 mm (females: body 66 mm, tail 22 mm; males: body 70 mm, tail 29 mm). Short, soft, flexible rostral process, crenulated dorsal keel, inter-orbital ridge present, axillary and inguinal pits present, plantar surfaces smooth, claws with prominent secondary cusp, low accessory plantar tubercles present, scalation heterogeneous.

R. spectrum: total length up to 90 mm (females: body 57 mm, tail 33 mm; males: body 61 mm, tail 29 mm); soft rostral appendage, crenulated dorsal keel, prominent supra-optic peak present, distinct inter-orbital ridge, axillary pit present, no inguinal pits, palms and soles clad with sub-conical to smooth tubercles, claws markedly biscupid, prominent accessory spines.

R. spinosus: Maximum total length of 87 mm; ashgrey coloration, rostral process prominent, up to 4mm, spinous tubercles scattered on flanks, tail, legs and gular regions.

R. temporalis: total length up to 80 mm, with tail more than 33% (females: body 46 mm, tail 18 mm; males: body 50 mm, tail 25 mm). Dermal rostral process short, may be indistinct. Supra-orbital peaks low to indistinct, dorsal keel weakly crenulated, distinct inter-orbital ridge of 16-18 tubercles, plantar surfaces usually smooth, occasionally sub-spinous, claws simple, accessory plantar spines prominent, scalation finely hetero/homogeneous.

R. tilburyi: total length of 40-70 mm, brown body. The males tend to be smaller than the females and have a prominent fold of skin on the snout, creating a distinctly 'nose-like' look (FFI 2014).

R. uluguruensis: Gender isometry, max. length 50 mm, tail 21-24.5% of total length. 11-13 inter-orbital tubercles, soft tuberculated dermal rostral process, axillary pits present, inguinal pits absent, strongly biscupid claws, plantar surfaces smooth cobblestoned appearance, low accessory plantar spines, hemipenes with papillae on each apical horn.

R. viridis: total length up to 89 mm (females: body 45 mm, tail 22 mm; males: body 44 mm, tail 29 mm), No supra-optic peaks, temporal crest prominent, no enlarged conical tubercle above the shoulder, rostral process small, occasionally indistinguishable, claws simple, hemipenis calyculate with dual apical horns, Inguinal and axillary pits present.

Rieppeleon species are typically brown, have stripes across their flanks, running horizontal from the head to the tail. They are capable of changing coloration, e.g. becoming darker when under stress and may mimic dry leaves: No rostro-nasal processes are found.

R. brachyurus: total length up to 58 mm (females: body length 50 mm, tail of 8 mm; males: body 46 mm, tail 7 mm); no gular crest or appendage, supra-optic peak firm non-pliable, inter-orbital ridge usually incomplete may be very indinstinct, axillary dermal pit present, no inguinal dermal pit, fine homogeneous granular scalation, lateral flank ridge present, dorsal keel weakly crenulated to almost smooth, plantar surfaces covered with acuminate tubercles, claws with a weak secondary cusp, no accessory plantar spines, males dwarfed compared to females.

R. brevicaudatus: total length up to 94 mm (females: body 75 mm, tail 17 mm; males: body 72 mm, tail 22 mm); a tuberculated mental lobe (tuft) is present under the chin, prominent bony supra-optic peak, inter-orbital ridge usually marked, axillary dermal pit present, inguinal dermal pit absent, fine homogenous granular scalation, dorsal keel weak to moderately crenulated, claws with a weak secondary cusp, sexual isometry.

R. kerstenii: total length up to 100 mm (females: body 71 mm, tail 33 mm; males: body 67 mm, tail 30 mm); a thin lateral ridge is present along the flank, dorsal keel relatively smooth, prominent bony supra-optic peak in males, distinct inter-orbital ridge, no inguinal or axillary dermal pits, plantar

surfaces covered in acuminate tubercles, no accessory plantar spines, claws variably bicuspid – weak to moderate, tail usually more than 30% of total length. *R. kerstenii robecchii* can be distinguished from the nominate form by a more developed supra-optic peak in males, which more appears like a horn, body is more slender, with longer limbs.

3.5 Role of the species in its ecosystem

Pygmy chameleons feed mainly on insects, including beetles, juvenile cockroaches, moths, caterpillars, grasshoppers, woodlouse, spiders, termites and flies (Tilbury 2010). Females were found to exhibit a wider food niche width than males (Akani *et al*. 2001). Pygmy chameleons may be in competition with forest toads (*Bufo camerunensis*), which may have a very similar dietary spectrum (Akani *et al.* 2001). Snakes are known predators of African pygmy chameleons (Akani *et al.* 2001), while many birds, small mammals, toads, frogs and even the larger ground living spiders are assumed to hunt these pygmy chameleons, too (Tilbury 2010).

4. Status and trends

4.1 Habitat trends

Forest areas within the range of African pygmy chameleons have suffered from the effects of deforestation. Nigeria and Tanzania are among the 10 countries with the highest annual net loss of forests (FAO 2010). Plantations, illicit tree felling, bush fires and expanding gardens are rapidly eroding the edges of the forest in many range states (FAO 2010; Carrere 2010). This habitat degradation has serious impacts on *Rhampholeon* populations because they are mostly dependent upon the forest biome and do not appear to adapt well to degraded forest habitats. Most of the taxa are restricted to isolated forest patches (Tilbury 2010; Matthee *et al*. 2004). Habitat destruction and contraction are reported over the whole range of *R. marshalli*. Areas like the Stapleford and Chirinda forests are under human pressure for wood supplies and land for cultivation. Large areas of the Eastern Usambaras, habitat of *R. temporalis*, are utilized for commercial purposes with coffee and teak plantations in the lower and mid elevations and with tea on the higher reaches. The three remaining patches of forest on the North Pares, range of *R. viridis,* cover an estimated area of 151 square kilometres, of which only 25 is of mature forest, whilst on the South Pares, the remaining 5 patches cover 333 square km of which 120 km² is of mature forest. The evergreen forest on Malawi Hill is nominally protected within the Matandwe Forest Reserve. Even so, illicit tree felling, bush fires and expanding gardens are rapidly eroding the forest edges of *R. chapmanorum's* habitat. The vegetation and fauna of Mulanje, including *R. platyceps,* are threatened by clearing of forest and woodland for subsistence farming, uncontrolled firewood collection and pole cutting, cutting of sreambank trees, theft of cedars, wild fires and invasive plants. The forests have undergone marked shrinkage: In the case of Chisangole a forest reduction from 38km² to 25 km² within the period 1974-1984 (Tilbury 2010).

4.2 Population size

Data on population size and demography of the different pygmy chameleon species are scarce.

Four Rhampholeon species are now classified as Critically Endangered: *Rhampholeon acuminatus, R. bruessoworum, R. chapmanorum, R. tilburyi*. Four Rhampholeon species are classified as Endangered: *R. platyceps, R. spinosus, R. temporalis, R. viridis*. Classified as Vulnerable are *Rhampholeon beraduccii, R. marshalli*, and *R. nebulauctor*, while six (*Rhampholeon boulengeri, R. gorongosae, R. moyeri, R. nchisiensis, R. spectrum, R. uluguruensis*) are classified as Least Concern. *R. maspictus* is classified as Near Threatened, while the remaining *R. hattinghi* is not yet assessed (ICUN 2014). *R. spinosus* is described as uncommon (Mariaux 2010b). Patrick *et a*l. (2011) report density of R. temporalis in forests of the East Usambara Mountains of 0.6/100 m of transects.

All three *Rieppeleon* species are classified as Least Concern (IUCN 2014). *R. spectrum* ("Least Concern") has been reported as common in parts of southern Nigeria and in montane areas of Cameroon; however, it is thought to be rarer in the lowlands and low abundance has been observed in degraded habitat (Mariaux & LeBreton 2010; Akani *et al.* 2001). In edges, *R. brevicaudatus* was found at densities of 0.026/100 m of transects (Patrick *et al.* 2011).

4.3 Population structure

African pygmy chameleons live solitarily. A survey in the Amani Nature Reserve, Tanzania, found that the number of adult specimens of *R. temporalis* was sixfold to that of juveniles (Patrick *et al.* 2011). Sex ratio of males and females seem to be almost equal, as described for *R. temporalis* and *R. spectrum* (Patrick *et al.* 2011; Akani *et al*. 2001). Pygmy chameleons may be found throughout the year, but in some species there appear to be marked population swings, with the dips coinciding with the dry season and peaking with the wet. Within this seasonal fluctuation population density may also reflect changes in predation intensity (Tilbury 2010).

4.4 Population trends

Serious habitat degradation in combination with ongoing collection, are reasons for concern: Presently, 18 out of 19 Rhampholeon and all three *Rieppeleon* species are classified in the IUCN Red List (2014). According to IUCN (2014) populations of *R. boulengeri, R. bruessoworum, R. chapmanorum, R. marshalli, R. platyceps, R. spinosus, R. temporalis, R. tilburyi,* and *R. viridis* are decreasing. Status of *R. acuminatus, R. beraduccii, R. nebulauctor, R. spectrum* as well as all three *Rieppeleon* species is unknown.

During a survey in Tanzania, *R. brevicaudatus* was the least counted chameleon at the Amani Nature reserve (Patrick *et al.* 2011), and in Cameroon, *R. spectrum* was in lower abundance than the CITES listed *Chameleo montium* (Gonwouo 2007). Although detailed studies are scarce, habitat loss and off-takes for commercial trade are assumed to decimate the populations of African pygmy chameleons (IUCN 2014; Tilbury 2010; Patrick *et al.* 2011).

4.5 Geographic trends

All *Rhampholeon* species are dependent upon intact forest strata – it is expected that they will disappear in sites under pressure of deforestation, logging or agricultural use (Tilbury 2010). *R. spinosus* has disappeared from survey sites in the Amani Nature Reserve, Tanzania, where it was recorded in earlier surveys, which might be a consequence of collection for the pet trade. Scientists failed to locate a single individual of the endemic *R. spinosus* in the area, even though they had previously found this species in the study area (Patrick *et al.* 2011). Furthermore, *R. spectrum* has disappeared from study sites in mature secondary forest in Nigeria, after logging (Akani *et al.* 2001).

5. Threats

Because of their specialized habitat requirements African pygmy chameleons as a group, especially the rare and more specialized species (e.g. *R. spinosus, R. marshalli, R. temporalis*, *R. platyceps*), are threatened by habitat loss and degradation, reducing the extent and quality of habitat (Branch *et al.* 2014; Tilbury 2010; Burgess *et al*. 2007; Akani *et al*. 2001): Overgrazing, fuel-wood collection, slash and burn agriculture, tea, coffee and palm oil plantations, inappropriate fallow systems, and urban expansion are all considered to be very serious threats to these species (Mariaux & LeBreton 2010). Tanzania and Nigeria are among the 10 countries with the largest annual net loss of forests. During the last decade this annual loss was 1.9% and 3.67%, respectively. In Cameroon, present annual loss is 1.07%,in Malawi 0.99%, and Equatorial Guinea 0.71% (FAO 2010). In several range states, including Tanzania, Cameroon, and Republic of Congo, palm oil plantations are quickly expanding or are currently in preparation (Carrere 2010).

While habitat destruction and degradation is the most serious risk for pygmy chameleons, collection for the international pet trade is a factor, which exacerbates the situation for several African pygmy chameleons, e.g. *R. acuminatus*, *R. spinosus*, *R. spectrum*, *R. temporalis, R. viridis* and *R. temporalis* (IUCN 2014; Patrick *et al.* 2011; Gonwouo 2007). Reptile keepers report that international demand for pygmy chameleons have increased since the mid 1990s (Anderson 2014; Hildenhagen 2007; Lutzmann *et al*. 2004). This has been confirmed by the US import data (see 6.2), which indicate a significant interim increase after 2001 and reaching a peak of 22,527 in 2007 (see Annex). This sharp increase has been obviously a consequence of trade restrictions for other chameleons; however, since 2012, import numbers have dropped down to 4-5,313 per annum (Annex). Even pygmy chameleon species that have only been discovered within the last few years are already object of the international pet trade, e.g. *R. acuminatus* and *R. viridis* (Mueller & Wallbröl 2008).

6. Utilization and trade

6.1 National utilization

Chameleon species in East Africa are collected for medicinal use or "juju" practice (Akani *et al.* 2001); however, it is unclear whether African pygmy chameleons are affected.

6.2 Legal trade

There is an increasing market for African pygmy chameleons in the international pet trade – obviously in reaction to CITES listings of other small chameleons (i.e. *Brookesia* spp. in 2002). Tanzania so far has been the leading exporter of African pygmy chameleons, according to US trade data (LEMIS Database 2015) and websites of internet traders. The USA recorded the import of 185,533 animals as "Rhampholeon" from 2001 to 2014) (US LEMIS Database 2015).These data contain imports of those species that were recently re-classified as *Rieppeleon*, i.e. *R. kerstenii* (104,721), *R. brevicaudatus* (61,785 individuals) and *R. brachyurus* (497). Furthermore, 11,293 chameleons were not identified on the species level but only recorded as "*Rhampholeon* species". According to US import data 99.6 % and 98.24% individuals of *Rhampholeon* and *Rieppeleon,* respectively, are wild-caught (US LEMIS Database 2015).

R. kerstenii is the most frequently imported African pygmy chameleon in the USA: Within the period 2011-2014, a total number of 104,721 individuals were recorded, almost all of them coming from Tanzania, with a small number also from Kenya. 97.3% were wild-caught (US LEMIS 2015). However, according to Tolley (2014) shipments labelled as *R. kerstenii* typically contain *R. brevicaudatus* and *R. temporalis*. At reptile fairs and in the internet, specimens are offered by traders from Austria, Czech Republic, Netherlands, United Kingdom and Germany, often under the old name "*Rhampholeon kerstenii*" (UNEP-WCMC 2009; Auliya 2003; www.exotic-pets.co.uk; www.zooaustria.com; www.faunaimportuk.com; www.terraristik.com; www.zoofachgeschaeft.at; www.cardiffreptilecentre.co.uk; www.reptilica.de). Prices vary between 29 and 60 € within Europe and 3 USD at exporters in Tanzania (Mindeme 2009).

R. brevicaudatus: Within the period 2000-2014 the USA imported 61,785 individuals of this species – 99.98% taken from the wild and 99.6 % with the purpose of commercial trade. Numbers in trade might be underestimated due to mislabelling as *R. kersteni* (see above, Tolley 2014). The bulk of *R. brevicaudatus* are coming from Tanzania, while Cameroon has been recorded as another export country (US LEMIS 2015), although it is not a range state for this species. In Europe, traders from Belgium, Czech Republic, Germany, Netherlands, Spain and United Kingdom are offering this species in the internet and at reptile fairs – often under the old name "*Rhampholeon brevicaudatus* (e.g. www.exotic-pets.co.uk; www.animalfarm.cz; www.terraristik.com; www.reptilica.de; www.scales-reptiles.com; www.chameleons-vl.be). The animals cost 25-69 Euro within Europe (UNEP-WCMC 2009), while prices at exporters in Tanzania are only 3 US $ (Mindeme 2009).

R. spectrum: In the Mt. Cameroon region this species is the most frequently collected chameleon species after *Ch. montium*: 20 *R. spectrum* are caught on average per collector and month for the international pet trade (Gonwouo 2007). The USA recorded the import of 6,392 animals during the years 2000-2014. Almost half of the animals came from Equatorial Guinea (3,684), followed by Cameroon (2,388), Guinea (100), and Tanzania (100). All animals were wild-caught and all but 11 were destined for commercial trade (US LEMIS Database 2015). The species is widely sold in Europe: In Germany, Czech Republic, Italy, Netherlands, and the United Kingdom, several traders offer specimens, often marked as wild-caught, at reptile fairs and in the internet (UNEP-WCMC 2009; on sale at www.terraristik.com; www.animalfarm.cz; www.animal-paradies.de; www.terraristikladen.de; www.tarantulaspiders.com; www.cardiffreptilecentre.co.uk and many more). Prices vary between 30-50 Euros.

R. acuminatus: It is reported that in some recent shipments to Germany this species has been the dominant species (Mueller & Walbröl 2008). The species is widely available in Europe: Internet traders in Denmark, Germany, Spain, Netherlands, United Kingdom and Belgium are selling wild-caught animals, for about 60-75 Euro (UNEP-WCMC 2009; www.exotic-pets.co.uk; www.dhd24.com; http://stconnection.de; www.reptilienserver.de; www.scales-reptiles.com). Within the period 2000-2014, the USA imported 203 *R. acuminatus*, all of them wild-caught in Tanzania (US LEMIS Database 2015); however more individuals may be included in shipments nonspecifically labelled as "*Rhampholeon* species". In the USA, prices are 150 US $ (e.g. www.generalexotics.com).

R. brachyurus: This species was recorded in US imports for the first time in 2013; imports in 2013 and 2014 summed up to 497 specimens, all from Tanzania and all noted as wild-caught (US LEMIS 2015), but may have been hidden in former shipments of unspecified *Rhampholeon*. In European pet trade this species fetches prices of about 40 Euro (Germany) to 47 Euro (Poland).

R. uluguruensis: This species was recorded in US imports for the first time in September 2012; imports until end of 2014 summed up to 398 specimens, all from Tanzania and all noted as wild-caught (US LEMIS 2015). *R. uluguruensis* is on sale in several European countries (Germany, Netherlands, United Kingdom) for about 27-45 Euro.

R. temporalis is regularly offered by vendors from Czech Republic, Germany, Netherlands, Spain, and United Kingdom have this species for sale; prices are 17-30 Euro (e.g. www.terraristik.com). There are no records for this species in the US LEMIS database; however the species is often sold misidentified as either *R. kerstenii* or *R. brevicaudatus* (Tolley & Menegon 2014b).

R. viridis is regularly on sale in Europe, e.g. Czech Republic, Germany, and United Kingdom – prices for wild-caught specimens are 70-130 Euro. This species was recorded in US imports for the first time in August 2013; imports in 2013 and 2014 summed up to 244 specimens, all from Tanzania and all noted as wild-caught (US LEMIS 2015). In the USA this species is offered for about 150 USD.

Also *R. boulengeri, R. nchisiensis*, and *R. uluguruensis* are offered by internet traders in Europe, e.g. from Belgium, the Czech Republic, Germany, Netherlands, Slovakia, Spain, and United Kingdom (UNEP-WCMC 2009; Auliya 2003; offers at www.terraristik.com; www.exotic-pets.co.uk; www.the-livingrainforest.co.uk; www.reptilienserver.de; www.scales-reptiles.com; www.animal-paradies.de; www.animalfarm.cz; www.terraristikladen.de; www.dhd24.com). Prices in Europe are 30-45 € (*R. temporalis*), 40 € (*R. boulengeri*), 45 € (*R. uluguruensis*), 60 € (*R. nchisiensis*) and 65-120 € (*R. viridis*). Prices at a Tanzanian exporter are 20 US $ for *R. nchisiensis,* 15 USD for *R. boulengeri,* 10 US $ for *R. uluguruensis* (Mindeme 2009).

R. moyeri is occasionally available in European pet shops (e.g. Short's Tropical Connection 2012). Keepers report that animals are wild-caught in Tanzania (Busch & Graeber 2005). Several *R. brachyurus* were offered in the internet from a Czech trader (www.terraristik.com).

Unidentified *Rhampholeon* specimens: According to US LEMIS Data (2015) the US within the period 2000-2014 recorded the import of 11,293 "*Rhampholeon* species", of which species identification remains open. 99.7% were wild-caught, 98.4 % were for commercial trade. The dominant exporter was Tanzania, followed by Cameroon, Equatorial Guinea, and Guinea, which is not a range-state for pygmy chameleons. Prices at a Tanzanian exporter for "*Rhampholeon montane*" were 20 US $ (Mindeme 2009).

6.3 Parts and derivatives in trade

Only live animals are known to be in trade.

6.4 Illegal trade

Kenya prohibits collection and exports of wild collected specimens as only legally captive bred specimens are allowed into trade, the USA in 2000 imported 16 specimens of *R. kerstenii* from Kenya (US LEMIS 2015). In Cameroon, collection of reptiles is only permitted by license, but this rule is often ignored by local people (Gonwouo 2007).

6.5 Actual or potential trade impacts

Contrary to other chameleons having an arboreal lifestyle, *Rhampholeon* and *Rieppeleon* are mostly terrestrial (Akani *et al.* 2001), which facilitates their collection. While habitat destruction and degradation are the major threats for the African pygmy chameleons, trade is an additional and increasing threat: IUCN (2014) warned that the removals of *R. acuminatus* could be detrimental and that "the species should be listed on CITES as soon as possible". The serious look-alike problem facilitates an indiscriminate trade of assorted pygmy chameleons, which hampers the enforcement of quotas for the CITES-listed *R. spinosus* (IUCN 2014).

While according to US import data in 2000 and 2001, a total of 5,719 and 6,330 animals were imported, the trade in *Rhampholeon* sharply increased to annual numbers of more than 10,000, with a peak of 22,527 in 2007 (US LEMIS 2015). The interim boom was obviously in reaction to the CITES Appendix II listing of other pygmy chameleons (*Bradypodion* spp.) in 2002. Reptile magazines confirm an increased interest in keeping both *Rhampholeon* and *Rieppeleon* (Coevoet 2007; Anon. 2005). Even species, which were only described a few years ago and have a very restricted distribution, are now offered in international pet trade in considerable numbers, e.g. *R. acuminatus* and *R. viridis* (Mueller & Walbröl 2008) – being classified as Critically Endangered and Endangered, respectively (Tolley *et al*. 2014). Scientists warn that African pygmy chameleons, especially those in diminished forest patches, are prone to over-collection and even may become extinct: For example villagers in the Usambaras have identified chameleons as the most collected vertebrates (Patrick *et al*. 2011), which is probably affecting *R. temporalis* and *R. viridis*. In Southwest Cameroon villagers are intensely collecting *R. spectrum* to satisfy the demand of international reptile traders (Gonwouo 2007). Furthermore, the unregulated trade in *Rhampholeon* and *Rieppeleon* compromises wild populations of *R. spinosus*, which is the only CITES-listed species of its genus, classified under IUCN as Endangered (Mariaux 2010b) and which is now increasingly found in shipments of wild caught "assorted pygmy chameleons"(Anderson 2011). Scientists expressed concerns that pygmy chameleons, being the only chameleons not covered by CITES and with trade so far being unmonitored and unregulated, may be vulnerable to over-exploitation (IUCN 2014; Patrick *et al.* 2011).

7. Legal instruments

7.1 National

All Chameleons in Kenya are listed in the category of protected species under the national Wildlife Conservation and Management Act, 2013.

7.2 International

None, with the exception of *R. spinosus*, which is listed in CITES Appendix II under its former name *Bradypodion spinosum.*

8. Species management

8.1 Management measures

For *R. spinosus* (listed as *Bradypodion spinosum* in CITES Appendix II) Tanzania has set the following export quota: 8 in 2001, 39 in 2002, 50 in 2003, 38 in 2004, 28 in 2005, 19 in 2006, 26 in 2007, 24 in 2008, 18 each in the years 2009-2011. These quotas are for F1-specimens (CITES national export quotas for Tanzania 2001-2011).

8.2 Population monitoring

No information on monitoring is available.

8.3 Control measures

8.3.1 International

A number of species as indicated earlier are listed in the IUCN threatened categories (www.iucnredlist).

8.3.2 Domestic

These species are protected by the national Wildlife Conservation and Management Act, 2013.

8.4 Captive breeding

Hobbyists occasionally report captive breeding of different *Rhampholeon* and *Rieppeleon* species (e.g. Gostner 2009; Anon. 2007; Coevoet 2007; Lutzmann *et al.* 2004); however, it seems that

mortality is high, due to eggbound, inappropriate temperature and humidity (Gostner 2009; Deckers 2006; Stemper 2006; Busch & Graeber 2005). Captive breeding of African pygmy chameleons on a commercial scale remains economically unprofitable and hence the vast majority are still collected in the wild (Auliya 2003, see also US LEMIS Database 2015).

8.5 Habitat conservation

R. marshalli is only protected in the Chimanimani and Nyanga National Parks and the Bunga Forest Botanical Reserve in the Vumba Mts. Currently most of the remaining habitat of *R. temporalis* is protected within the East Usambara Forest Conservation Project (Amani Forest Reserve) and related forest conservancies in the East Usambara. *R. moyeri:* At present the Udzungwa National Park is the first and only area in the "Eastern Arc" to be protected for its biodiversity and given realistic long-term protection. *R. nchisiensis:* Only the Malawian Nyika Plateau is protected as a National Park. Populations of other African pygmy chameleons occur in unprotected areas or in nature reserves, which in practice do not have high protection status (Tilbury 2010; Mariaux 2010 a,b; Mariaux & LeBreton 2010).

R. boulengeri is protected in Kakamega forest and other protected areas in western Kenya. *R. kersternii* is present in Tsavo, Marsabit, Shimba Hills, Meru, Samburu, Arabuko-Sokoke among other protected areas. *R. brevicaudatus* is present in Shimba Hills National Reserve and Gongoni forest (Spawls et al. 2002).

9. Information on similar species

Rhampholeon and *Rieppeleon* species are easily confused due to small size, partially similar colours and compact body. For non-experts African pygmy chameleons are also difficult to discriminate from some *Bradypodion* species, such *as B. thamnobates* or *B. caffrum*, which are listed in CITES Appendix II.

10. Consultations

Consultations are ongoing and already Senegal has confirmed support.

11. Additional remarks

With regard to the fact that *R. spinosus* is the only species in its genus that is covered by CITES, the IUCN Red List notes that trade management is required (IUCN 2014; Mariaux 2010b). Also Patrick *et al.* (2011) expressed concern about the non-CITES status of the pygmy chameleons while being intensely collected for the international pet trade. The chameleon expert Chris Anderson stresses enforcement problems caused by the present situation: He reports that there are regular shipments of "assorted pygmy chameleons", in which the CITES listed *R. spinosus* was included (Anderson 2014). This is another argument to list all unlisted pygmy chameleons in CITES Appendix II.

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