

**New taxa within the African Herald Snake  
genus *Crotaphopeltis* Fitzinger, 1843.**

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**ABSTRACT**

Following extensive fieldwork by Raymond Hoser in Africa in 2009 and after catching and inspecting large numbers of various forms of the widespread Herald Snake (Genus *Crotaphopeltis* Fitzinger, 1843), the genus was subjected to an intensive audit, including inspection of specimens of all previously named species in the genus, as well as a review of literature, published photos and the like. This examination included snakes from locations across the known sub-Saharan distribution of the genus as currently recognized.

The result of the audit included the recognition of the six currently widely recognized species, *Crotaphopeltis barotseensis* Broadley, 1968, *C. braestrupi* Rasmussen, 1985, *C. degeni* (Boulenger, 1906), *C. hippocrepsis* (Reinhardt, 1843), *C. hotamboeia* (Laurenti, 1768) and *C. tornieri* (Werner, 1908).

Also resurrected from the synonymy of *C. degeni* (Boulenger, 1906), type locality Entebbe, Uganda, is the related taxon, *Leptodira attarensis* Werner, 1908 from South Sudan and nearby west Ethiopia (Gambela).

An allied species *Crotaphopeltis andreeblouinae* sp. nov. from Cameroon and the Central African Republic is formally named for the first time.

The species *C. tornieri* (Werner, 1908), type locality Usambara Mountains, Tanga Province, northeastern Tanzania is split into four species, with the population from Mount Rungwe, Tanzania Ukinga to the south and the nearby Misuku Mountains in Malawi formally named as *Crotaphopeltis juliusnyererei* sp. nov..

Those morphologically similar specimens from the Ufipa Plateau are formally named *C. ufipaensis* sp. nov.. The divergent population from the Rondo Plateau area of south east Tanzania are formally named as *C. rondoensis* sp. nov..

The remaining population of nominate *C. tornieri* (mainly in the north-east) is also split with the south-western population from the Udzungwa Mountains being formally described as a new subspecies *C. tornieri udzungwaensis* subsp. nov..

The most widely distributed species *C. hotamboeia* is formally split into six subspecies, four formally named for the first time.

The most divergent species in the genus *C. barotseensis*, believed to have diverged from the others about 15 MYA, is herein placed in a new genus *Paracrotaphopeltis* gen. nov..

Taxonomic vandalism by way of pretending these forms are not unique, or by assigning them non-ICZN compliant duplicate names could hamper conservation to the degree that one or more way well become extinct as has already happened for other similarly affected taxa, including as detailed in Hoser (2019a, 2019b).

**Keywords:** Africa; Snake; Reptilia; Squamata; Serpentes; Colubridae; *Crotaphopeltis*; *barotseensis*; *braestrupi*; *degeni*; *hippocrepsis*; *hotamboeia*; *tornieri*; *attarensis*; *ruziziensis*; Congo; Cameroon; Tanzania; Sudan; Ethiopia; Central African Republic; Ufipa plateau; Rondo plateau; new genus; *Paracrotaphopeltis*; new species; *andreeblouinae*; *juliusnyererei*; *ufipaensis*; *rondoensis*; new subspecies; *udzungwaensis*; *rubrumlabellum*; *luteuslabellum*; *labellumpulvereus*; *albalinguacaloso*.

## INTRODUCTION

In mid 2009, I, Raymond Hoser travelled from Australia to Africa to conduct fieldwork on the reptiles and frogs there.

While collecting large numbers of Herald Snakes of the genus *Crotaphopeltis* Fitzinger, 1843 at various locations and when also viewing live specimens in collections, it became clear that the species and subspecies diversity in the genus *Crotaphopeltis* as presently conceived by most publishing herpetologists was being underestimated.

The best known species, and type for the genus *C. hotamboeia* (Laurenti, 1768) in particular, varied morphologically across the known distribution, including within South Africa, which is where these snakes are probably best known and most frequently collected.

Another relatively little-known species within the genus, *C. braestrupi* Rasmussen, 1985 appeared to be quite divergent in morphology and habit and so was in my view worthy of investigation to see whether or not it should be transferred to another genus, or one erected for it.

As a result of the question marks raised while in Africa, I decided to audit the entire sub-Saharan genus as currently known with a view to seeing if all obvious species or regional variants, had already been named and/or had available names and if not, which ones were they and at what level should any new taxonomic placements be made.

## MATERIALS AND METHODS

The audit included of a review of the previously published literature relevant to the genus, with a particular emphasis on type descriptions and publications of a taxonomic nature.

After stripping those from consideration that were derivative, rather than original in nature, it soon became clear that very little had been published on the genus.

With respect of the best-known and most widely distributed species, while it was known and self evident that there were different forms in different parts of southern and central Africa, the taxonomic works invariably kept naming and renaming the main southern South African form.

In terms of the other putative species, it soon became clear that as one moved north, knowledge became sketchier and confusion by authors as to identification of species also became apparent.

Museums audited also often had species in their collections misidentified.

Live and dead specimens were examined as were photos of specimens with good locality data.

Known distributions of relevant forms were mapped, with barriers between populations investigated to determine if they were of recent and potentially "man made" form, or if they had been around for longer and if so, how long?

Where specimens appeared to be divergent, gaps in distribution were identified and a timeline put on this either by way of reference to previous molecular studies, biogeographical evidence, or both and if morphological divergence matched a dated divergence then it was determined to recognize the relevant taxa.

As already inferred, the relevant previously published literature was checked to see if there were any available synonyms for these apparently unnamed forms and if there were, these would obviously be used in preference to any new name to be proposed.

Taxonomic vandalism as practiced by Kaiser *et al.* (2013) (and later incarnations) is not the majority view of herpetologists or scientists in general, not my view either and was furthermore scathingly condemned by the ICZN in a ruling dated 30 April 2021, followed by an openly published editorial early in 2023 (ICZN 2021, Ceriaco *et al.* 2023).

Literature relevant to the taxonomic conclusions with respect

of the populations of the above-mentioned species or species groups within *Crotaphopeltis* Fitzinger, 1843 *sensu lato*, included the following: Angel (1925), Angenstein (1996), Auerbach (1987), Baptista *et al.* (2019), Barbour and Amaral (1927), Barbour and Loveridge (1928), Barnett (2001), Barnett and Emms (2005), Bates *et al.* (2014), Behangana *et al.* (2020), Beolens *et al.* (2011), Bittencourt-Silva (2019), Bocage (1866), Boettger (1893), Bogert (1940), Böhme and Schneider (1987), Böhme *et al.* (2011), Boulenger (1896, 1897, 1906), Boycott (1992), Branch (1993, 2005), Branch *et al.* (2005, 2019), Broadley (1959, 1962, 1968, 1991), Broadley and Blaylock (2013), Broadley and Cotterill (2004), Broadley and Howell (1991), Broadley *et al.* (2003), Burger *et al.* (2004), Calabresi (1925), Chifundera (1990), Chippaux and Jackson (2019), Chirio (2009), Chirio and Lebreton (2007), Chirio and Ineich (2006), Conradie and Branch (2016), Conradie *et al.* (2016, 2020, 2021), Duméril *et al.* (1854), Engelbrecht (2017), Engelbrecht *et al.* (2020, 2021), Eniang *et al.* (2013), Ernst *et al.* (2020), Finke and Liepack (2021), Fitzinger (1843), Fraser (2023), Gans *et al.* (1965), Gemel *et al.* (2019), Gray (1858), Günther (1895), Haagner and Branch (1995), Haagner *et al.* (2000), Hallermann (1998), Hellmich (1967), Herrmann and Branch (2013), Honess and Bearder (1991), Hughes (2013, 2018), Jackson *et al.* (2007), Jacobsen (2009), Jacobsen *et al.* (2010), Joger (1982), Keogh *et al.* (2000), Lanza (1990), Lergen and Spawls (2010), Lergen and Rasmussen (1993), Laurenti (1768), Leaché *et al.* (2006), Lillywhite (2014), Loveridge (1929, 1936, 1938a, 1938b, 1956), Lyakurwa (2017), Lyakurwa *et al.* (2019), Malonza *et al.* (2006, 2017), Masters *et al.* (2017), Mehrtens (1967), Menzies (1966), Monard (1931, 1940), Nicolay (1989), Pauwels and Vande Weghe (2008), Pauwels *et al.* (2006, 2016, 2019, 2022), Peracca (1897), Pietersen *et al.* (2021), Pitman (1974), Pyron *et al.* (2013), Rasmussen (1981, 1985, 1993, 1997), Rasmussen and Huges (1996), Rasmussen *et al.* (2000), Razzetti and Msuya (2002), Reinhardt (1843), Ride *et al.* (1999), Robertson *et al.* (2003), Rödel and Mahsberg (2000), Rödel *et al.* (1999), Roman (1974), Rovero *et al.* (2014), Sapwell (1969), Schmidt (1963), Segniabeto *et al.* (2011, 2022), Scortecchi (1929, 1931), Seba (1734), Senter and Chippaux (2022), Smith (1849), Spawls *et al.* (2011, 2018), Sternfeld (1917), Tolley *et al.* (2023), Trape and Balde (2014), Trape and Collet (2021), Trape and Mané (2000, 2004, 2006, 2015, 2017), Trape and Roux-Esteve (1995), Trape *et al.* (2020), Ullénbruch *et al.* (2010), Venter and Conradie (2015), Wallach *et al.* (2014), Werner (1908), Zassi-Boulou *et al.* (2020) and sources cited therein.

## RESULTS

The the six currently widely recognized species within the genus *Crotaphopeltis* Fitzinger, 1843, being *Crotaphopeltis barotseensis* Broadley, 1968, *C. braestrupi* Rasmussen, 1985, *C. degeni* (Boulenger, 1906), *C. hippocrepis* (Reinhardt, 1843), *C. hotamboeia* (Laurenti, 1768) and *C. tornieri* (Werner, 1908), were all found to be valid and well documented in the relevant earlier literature.

In terms of the morphologically similar *C. degeni* and *C. tornieri*, issues arose including confusion among authors and museum curators as to which was which and how to separate the pair.

As a result specimens attributed to putative *C. degeni* (Boulenger, 1906), type locality Entebbe, Uganda were sometimes confused with putative *C. tornieri* (Werner, 1908), type locality Usambara Mountains, Tanga Province, northeastern Tanzania and vice versa. This was particularly for specimens outside of the immediate type localities.

To confuse things further, each of these putative taxa were soon found to be species complexes, of range-restricted endemics, being confined to regions of elevation or particular drainage basins or parts thereof.

In the final analysis several populations were found to warrant taxonomic recognition based on consistent morphological divergence.

Hence, resurrected from the synonymy of *C. degeni* (Boulenger, 1906), type locality Entebbe, Uganda, is the taxon, *Leptodira attarensis* Werner, 1908 from South Sudan and nearby west Ethiopia (Gambela).

An allied population from Cameroon and the Central African Republic is herein formally named in accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) as *Crotaphopeltis andreeblouinae* sp. nov. for the first time.

The species *C. tornieri* (Werner, 1908), type locality Usambara Mountains, Tanga Province, northeastern Tanzania is split into two species, with the population from Mount Rungwe, Tanzania formally named as *Crotaphopeltis juliusnyererei* sp. nov.. The remaining population of nominate *C. tornieri* is also split with the south-western population from the Udzungwa Mountains being formally described as a new subspecies *C. tornieri udzungwaensis* subsp. nov. on the basis of molecular divergence and morphological differences.

Two other geographically isolated and little-known outlier populations are formally named as new species. Those specimens morphologically similar to *Crotaphopeltis juliusnyererei* sp. nov. from the Ufipa Plateau are formally named *C. ufipaensis* sp. nov.. The divergent population from the Rondo Plateau area, south-east Tanzania are formally named as *C. rondoensis* sp. nov..

The species *C. ufipaensis* sp. nov. restricted to the Ufipa Plateau area to the west of Lake Rukwa in Tanzania, is similar in most respects to *C. juliusnyererei* sp. nov. and separated from it by a biogeographical barrier believed to have been present for more than 1 MYA in terms of this taxon (or 700K years at a minimum) and also effectively agreed in terms of molecular phylogenies published by Menegon (2014) for snakes of the similarly affected and constrained genus *Atheris* Cope, 1862. It is also morphologically divergent.

*C. rondoensis* sp. nov. occurring in the Rondo Plateau region of southern Tanzania, is also morphologically divergent from *C. tornieri udzungwaensis* subsp. nov. and *C. tornieri* further north.

It is self-evidently biogeographically isolated from other populations within the *C. tornieri* complex and is therefore evolving as a separate allopatric species.

While there is no time calibrated dating of divergence for this particular taxon, it is common-knowledge that the Rondo Plateau and environs is a region of high endemism in terms of east African fauna, including for example the iconic species *Paragalago rondoensis* (Honest and Bearder, 1997), see also Masters *et al.* (2017).

The most widely distributed species in the genus, *C. hotamboeia* was found by Engelbrecht *et al.* (2020) to consist of six well-defined clades. These are also consistently morphologically divergent. Therefore they are split into six subspecies, with four formally named for the first time.

In terms of this species group, the type form of *C. hotamboeia* and those for which most synonyms are available is that form from the far south of South Africa, being found from along the coast from around Cape Town in the West, east to about Durban and north to about Lesotho.

The name *Dipsas inornatus* Smith, 1849 with a holotype from Kaffirland eastward of Cape Colony, i.e. somewhere between East London (now known as Gqeberha) and Port Elizabeth, clearly also applies to this form.

This corresponds with Clade 4 in Engelbrecht *et al.* (2020).

*C. hotamboeia ruziziensis* (Laurent, 1956) from the Ruzizi-Kivu basin in Democratic Republic of the Congo corresponds to Clade 3 of Engelbrecht *et al.* (2020) and so is also already named.

The name *Tarbophis barnumhrowni* Bogert, 1940 from Jigjiga, Ethiopia, is also referable to this form based on the map in Fig 1, of Engelbrecht *et al.* (2020).

The remaining four, hitherto unnamed forms are identified and

formally named as follows:

1/ The red-lipped form from north of Lesotho in nearby South Africa, including the Johannesburg area is formally named *C. hotamboeia rubrumlabellum* subsp. nov. and corresponds with Clade 5 of Engelbrecht *et al.* (2020).

2/ The orange-lipped form from Eswatini, previously known as Swaziland, adjacent parts of north-east South Africa as well as most parts of Mozambique is formally named *C. hotamboeia luteuslabellum* subsp. nov.. It corresponds with clade 6 of Engelbrecht *et al.* (2020).

3/ The olive-brown form, with a mainly deep bluey grey tongue, found generally west of Kinshasa, Democratic Republic of Congo (DRC) in north-west Angola, including, nearby DRC, Congo (Brazzaville) and south west Gabon, is formally named *C. hotamboeia labellumpulvereus* subsp. nov.. It corresponds with clade 2 of Engelbrecht *et al.* (2020).

4/ The form with a purplish-brown tinge on the dorsum that is known only from south-east Kenya is formally named *C. hotamboeia albalinguacallosus* subsp. nov.. It corresponds with clade 1 of Engelbrecht *et al.* (2020).

Furthermore, what appears to be the most divergent species in the genus *Crotaphopeltis*, namely *C. barotseensis*, is believed to have diverged from the others about 20 MYA (Engelbrecht *et al.* 2021). On the basis of this extreme divergence and significant morphological differences, it is herein placed in a new genus *Paracrotaphopeltis* gen. nov..

#### INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spelling of names should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 24 April 2023, unless otherwise stated and were accurate in terms of the context cited herein as of that date.

Unless otherwise stated explicitly, colour descriptions apply to living adult male specimens of generally good health and not under any form of stress by means such as excessive cool, heat, dehydration or abnormal skin reaction to chemical or other input.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant species has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

In the unlikely event that one or more of the following taxa are synonymised by a later author/s, then the correct nomen to be used is that which occurs first by way of page priority, as listed in the abstract keywords.

Delays in recognition of these species and subspecies could jeopardise the long-term survival of the taxa as outlined by Hoser (2019a, 2019b) and sources cited therein.

Therefore attempts by taxonomic vandals like the Wolfgang Wüster gang via Kaiser (2012a, 2012b, 2013, 2014a, 2014b) and Kaiser *et al.* (2013) (as frequently amended and embellished, e.g. Rhodin *et al.* 2015, Thiele *et al.* 2020, Hammer and Thiele 2021) to unlawfully suppress the recognition of these taxa on the basis they have a personal dislike for the person who formally named it should be resisted (e.g. Dubois *et al.* 2019 and Ceriaco *et al.* 2023).

Claims by the Wüster gang against this paper and the

descriptions herein will no doubt be no different to those the genus have made previously, all of which were discredited long ago as outlined by Ceriaco *et al.* (2023), Cogger (2014), Cotton (2014), Dubois *et al.* (2019), Hawkeswood (2021), Hoser, (2007, 2009a, 2012a, 2012b, 2013, 2015a-f, 2019a, 2019b), ICZN (1991b, 2001, 2012, 2021), Mosyakin (2022), Wellington (2015) and sources cited therein.

Some material within descriptions is repeated to ensure each fully complies with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

#### **CROTAPHOPELTIS ANDREEBLOUINAE SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:AED0693D-DE75-4FC8-8C43-0FD5F19EA0F8

**Holotype:** A preserved in the Museum National d'Histoire Naturelle, Paris, France, specimen number MNHN 1978:1833, collected at Ngodeni, Cameroon, Africa, Latitude 11. 25 N., Longitude 15.00 E.

This facility allows access to its holdings.

**Paratypes:** Two preserved specimens in the Museum National d'Histoire Naturelle, Paris, France, specimen number MNHN 1978:1834-5, collected at Ngodeni, Cameroon, Africa, Latitude 11. 25 N., 15.00 S.

**Diagnosis:** Until now, *Crotaphopeltis andreblouinae sp. nov.* has been treated as a western population of *C. degeni* (Boulenger, 1906), with a type locality of Entebbe, Uganda (found generally around the northern edges of Lake Victoria and environs).

However it is in fact more similar to the related species *C. attarensis* (Werner, 1908), type locality of Khor Attar, South Sudan and also known from nearby west Ethiopia (Gambela), also until now also treated as a population of *C. degeni sensu Engelbrecht et al.* (2021), but herein resurrected from synonymy.

The three species are readily separated from one another by the following character sets unique to each.

Adult *C. degeni* (in life) have a narrow white (sometimes yellow) bar on lower upper labials, deep yellow lower flanks and belly, and a dorsum that is dark brown, grey-brown, grey or almost black.

In adult *C. attarensis* (in life) the white of the upper labials extends virtually to the eye and above it posterior to it, there are faded orangeish-yellow, lower flanks and venter, the dorsum is also dark brown, grey-brown, grey or almost black.

In both the above species on the underside of the tail, commencing just past the anal plate is a well defined medial stripe.

In adult *C. andreblouinae sp. nov.* (in life), the white of the upper labials extends virtually to the eye and above it posterior to it, there are faded orangeish-yellow, lower flanks and venter, the dorsum is pale brown above. This species is further separated from the other two by the fact that the medial stripe under the tail, seen in the other two species, is in *C. andreblouinae sp. nov.* either absent or ill defined.

The two to six enlarged hemipenial spines in males, separates these three species from the morphologically similar species *C. tornieri* (Werner, 1908), type locality Usambara Mountains, Tanga Province, northeastern Tanzania, including the associated subspecies from the nearby Udzungwa Mountains *C. tornieri udzungwaensis subsp. nov.* and *Crotaphopeltis juliusnyererei sp. nov.* from Mount Rungwe, and Ukinga, Tanzania and nearby Misuku Mountains in Malawi (found south-west of the other two preceding forms) which either have just one enlarged spine laterally and a somewhat enlarged spine medially in *C. tornieri*, or no obvious hemipenial spines in *C. juliusnyererei sp. nov.* Further morphological differences between the three preceding taxa, all treated as populations of *C. tornieri*, can be found in Rasmussen (1997).

The three species *C. degeni*, *C. attarensis* and *C.*

*andreblouinae sp. nov.* are separated from all others in the genus *Crotaphopeltis* Fitzinger, 1843, including the newly created *Paracrotaphopeltis gen. nov.*, by the following unique suite of characters:

Smooth scales all over (there are no feebly keeled posterior dorsals), with 19 midbody scale rows at mid-body, 31-41 (male) and 25-38 (female) subcaudals; 15-19+II maxillary teeth; hemipenis extending to subcaudal scute number 7-II and with about five (range is 2-6) enlarged spines proximally; dorsum dark brown, grey or almost black, or alternatively light brown, without any white specks or temporal marks. Pigment on the lower jaw is usually restricted to the last infralabial; venter yellow or faded orangeish yellow; underside of tail yellowish to whitish, and in two of the three species with a well defined, distinctly pigmented, median stripe, usually starting just behind the anal shield; only the most posterior infralabial pigmented; occiput not white in juveniles; the upper postocular is not separated from the supraocular by a forward prolongation of the parietal (modified from Rasmussen *et al.* 2000).

*C. degeni* (in life) is depicted in Spawls *et al.* (2011) on page 378, Largen and Spawls (2010), Figs 347 and 348 and online at: <https://www.inaturalist.org/observations/132795851>

*C. attarensis* is depicted in life online at: <https://www.inaturalist.org/observations/1127834>

**Distribution:** *C. andreblouinae sp. nov.* appears to be confined to Cameroon, in the elevated region near the Central African Republic and Chad, as well as the Central African Republic including the upper reaches of basins flowing into the Congo Basin.

**Etymology:** *C. andreblouinae sp. nov.* is named in honour of Andrée Madeleine Blouin, born 16 December 1921 and died 9 April 1986. She was a political activist, human rights advocate, and writer from the Central African Republic, campaigning all her life against European colonialism. It is important that at least some of the time, that species names reflect people in the countries these taxa come from and not just names of people from the colonial powers in the form of nepotism.

Therefore I note that the choice of nomen for this taxon is a deliberate step to restoring the imbalance formed by the naming of taxa in honour of conquering persons during the colonial period.

#### **CROTAPHOPELTIS JULIUSNYEREREI SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:529E1783-1E79-4691-8A32-0770AAF3D102

**Holotype:** A preserved specimen at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen number ZMUC-R631260 collected from the Rungwe Mission, Mount Rungwe, Tanzania, Africa, Latitude - 9.166666 S., Longitude 33.600000 E.

This facility allows access to its holdings.

**Paratypes:** All are preserved specimens at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen numbers ZMUC-R631257, R631258, R631259, R631261, all collected from Rungwe Mission, Mount Rungwe, Tanzania, Africa, Latitude - 9.166666 S., Longitude 33.600000 E., and specimen numbers MCZ Herp R-30254-30274 all collected from Nkuka Forest, Rungwe Mountain, near Mbeya, Tanzania, Africa, Latitude -9.133333 S. Longitude 33.666667 E.

**Diagnosis:** Until now *Crotaphopeltis juliusnyererei sp. nov.* from Mount Rungwe, Ukinga and environs, Tanzania and the nearby Misuku Mountains in adjacent Malawi has been regarded as a population of *C. tornieri* (Werner, 1908), with a type locality of the Usambara Mountains, north-east Tanzania. with which it is both most closely related to and morphologically similar to at the species level.

The molecular data of Engelbrecht *et al.* (2020) confirmed that it

is a separate species.

In the absence of an available name, it is herein formally named *C. juliusnyererei* sp. nov.

*C. juliusnyererei* sp. nov. is separated from *C. tornieri* and the related subspecies *C. tornieri udzungwaensis* subsp. nov. from the nearby Udzungwa Mountains by the following unique suites of characters (in mature adult specimens):

White upper labials; a dull-brownish-orange-grey iris; a dark olive-grey dorsum.

*C. tornieri* of the type form has a greenish head; a bright orange eye, upper labials are also green (slight whitening at the back labials, past the eye); a dark olive-grey dorsum.

*C. tornieri udzungwaensis* subsp. nov. has white upper labials (including below the eye and anterior to it); a bright orange eye; dark olive-to-grey dorsum, separating it from the two previously named taxa (above in this description).

The species *C. ufipaensis* sp. nov. restricted to the Ufipa Plateau area to the west of Lake Rukwa in Tanzania, is similar in most respects to *C. juliusnyererei* sp. nov. and separated from it by a biogeographical barrier believed to have been present for more than 1 MYA in terms of this taxon (potential min. being about 700K years) and also effectively agreed in terms of molecular phylogenies published by Menegon (2014) for snakes of the similarly affected and constrained genus *Atheris* Cope, 1862. It is separated from *C. juliusnyererei* sp. nov. by having a medium olive-grey dorsum (versus darker) and 46 subcaudals in males (single specimen record) versus 37-47 in all populations of *C. juliusnyererei* sp. nov. (21 specimen records).

*C. rondoensis* sp. nov. is similar in most respects to *C. tornieri udzungwaensis* subsp. nov., but with a dull orange to reddish-brown iris and a higher average ventral count in females of 175 (1 specimen counted) versus 172 in *C. tornieri udzungwaensis* subsp. nov. (30 specimens counted) and consistently lower averages in all other species and subspecies within the *C. tornieri* complex as reported by Rasmussen (1993).

*C. rondoensis* sp. nov. occurring in the Rondo Plateau region of southern Tanzania, is self-evidently biogeographically isolated from other populations within the *C. tornieri* complex and is therefore evolving as a separate allopatric species. While there is no time calibrated dating of divergence for this particular taxon, it is common-knowledge that the Rondo Plateau and environs is a region of high endemism in terms of east African fauna, including for example the iconic species *Paragalago rondoensis* (Honest and Bearder, 1997).

The four species, *C. juliusnyererei* sp. nov., *C. ufipaensis* sp. nov., *C. rondoensis* sp. nov. and both subspecies of *C. tornieri* are separated from all others in the genus *Crotaphopeltis* Fitzinger, 1843, including the newly created *Paracrotaphopeltis* gen. nov., by the following unique suite of characters:

Dorsal scales keeled posteriorly, and with increasing size also anteriorly; 17 or 19 mid-body scale rows, 39-56 subcaudals (males) and 35-54 subcaudals (females); 15-20+II maxillary teeth; hemipenis extending to subcaudal scute no. 7-11 and with an enlarged spine laterally and a somewhat enlarged spine medially in *C. tornieri*, or no hemipenal spines in *C. juliusnyererei* sp. nov.; dorsum pale gray to almost black with various tints of brown and blue; ventrum whitish or cream in juveniles, becoming a paler shade of the dorsal color in adults, the pigment extending progressively further forward as size increases; underside of tail always more or less densely pigmented; upper postocular is not separated from the supraocular by a forward prolongation of the parietal (modified from Rasmussen, 1993).

*C. juliusnyererei* sp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/491820>

and

<https://www.inaturalist.org/observations/60050794>

*C. tornieri* in life is depicted in Spawls *et al.* (2011) on page 380

and online at:

<https://www.flickr.com/photos/rainforests/16125591481/>

and

<https://www.inaturalist.org/observations/132373883>

and

<https://www.inaturalist.org/observations/64591862>

and

<https://www.inaturalist.org/observations/100933240>

*C. tornieri udzungwaensis* subsp. nov. in life is depicted online at: <https://www.flickr.com/photos/euprepiosaur/15679402622/>

and

<https://www.flickr.com/photos/156667445@N07/52656136407/>

and

<https://www.flickr.com/photos/euprepiosaur/15493020720/>

and

<https://www.inaturalist.org/observations/100933240>

and

<https://www.inaturalist.org/observations/147885469>

**Distribution:** *C. juliusnyererei* sp. nov. is restricted to Mount Rungwe, Ukinga and environs, Tanzania and the nearby Misuku Mountains in adjacent Malawi. North east of this area in Tanzania in the hillier areas, the morphologically similar *C. tornieri* occurs.

**Etymology:** *C. juliusnyererei* sp. nov. is named in honour of Julius Kambarage Nyerere, born 13 April 1922 and died 14 October 1999. He was a Tanzanian anti-colonial activist, politician, and political theorist.

It is important that at least some of the time, that species named reflect people in the countries these taxa come from and not just names of people from the colonial powers in the form of nepotism.

Therefore I note that the choice of nomen for this taxon is a deliberate step to restoring the imbalance in scientific nomenclature formed during the colonial period.

**CROTAPHOPELTIS UFIPAENSIS SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:89023CBB-8ED0-4A7D-A9BC-94D6DE0C73BB**

**Holotype:** A preserved specimen at the Zoologisches Museum an der Humboldt Universität zu Berlin, Berlin, Germany specimen number ZMB 17256 collected from the Ufipa Plateau, west Tanzania.

This facility allows access to its holdings.

**Diagnosis:** *Crotaphopeltis ufipaensis* sp. nov. confined to the Ufipa Plateau, west Tanzania, has until now been treated as a population of the better known *Crotaphopeltis tornieri* (Werner, 1908), with a type locality of the Usambara Mountains, north-east Tanzania.

Until now *Crotaphopeltis tornieri* (Werner, 1908), has been treated as a composite species, including populations stretching south-west from the type locality to south-west Tanzania and into nearby Malawi.

*Crotaphopeltis juliusnyererei* sp. nov. from Mount Rungwe, Ukinga and environs, Tanzania and the nearby Misuku Mountains in adjacent Malawi has been regarded as a population of *C. tornieri* with which it is both most closely related to and morphologically similar to.

The molecular data of Engelbrecht *et al.* (2020) confirmed that it is a separate species-level taxon.

In the absence of an available name, it is herein formally named *C. juliusnyererei* sp. nov.

*C. juliusnyererei* sp. nov. is separated from *C. tornieri* and the related subspecies *C. tornieri udzungwaensis* subsp. nov. from the nearby Udzungwa Mountains by the following unique suites of characters (in mature adult specimens):

White upper labials; a dull-brownish-orange-grey iris; a dark

olive-grey dorsum.

*C. tornieri* of the type form has a greenish head; a bright orange eye, upper labials are also green (slight whitening at the back labials, past the eye); a dark olive-grey dorsum.

*C. tornieri udzungwaensis* subsp. nov. has white upper labials (including below the eye and anterior to it); a bright orange eye; dark olive-to-grey dorsum, separating it from the two previously named taxa (above in this description).

The species *C. ufipaensis* sp. nov. restricted to the Ufipa Plateau area to the west of Lake Rukwa in Tanzania, is morphologically similar in most respects to *C. juliusnyererei* sp. nov. and separated from it by a biogeographical barrier believed to have been present for more than 1 MYA (with a potential minimum of about 700 K year) and also effectively agreed in terms of molecular phylogenies published by Menegon (2014) for snakes of the similarly affected and constrained genus *Atheris* Cope, 1862. It is separated from *C. juliusnyererei* sp. nov. by having a medium olive-grey dorsum (versus darker) and 46 subcaudals in males (single specimen record) versus 37-47 in all populations of *C. juliusnyererei* sp. nov. (21 specimen records).

*C. rondoensis* sp. nov. is similar in most respects to *C. tornieri udzungwaensis* subsp. nov., but with a dull orange to reddish-brown iris and a higher average ventral count in females of 175 (1 specimen counted) versus 172 in *C. tornieri udzungwaensis* subsp. nov. (30 specimens counted) and consistently lower averages in all other species and subspecies within the *C. tornieri* complex as reported by Rasmussen (1993).

*C. rondoensis* sp. nov. occurring in the Rondo Plateau region of southern Tanzania, is self-evidently biogeographically isolated from other populations within the *C. tornieri* complex and is therefore evolving as a separate allopatric species. While there is no time calibrated dating of divergence for this particular taxon, it is common-knowledge that the Rondo Plateau and environs is a region of high endemism in terms of east African fauna, including for example the iconic species *Paragalago rondoensis* (Honest and Bearder, 1997).

The four species, *C. juliusnyererei* sp. nov., *C. ufipaensis* sp. nov., *C. rondoensis* sp. nov. and both subspecies of *C. tornieri* are separated from all others in the genus *Crotaphopeltis* Fitzinger, 1843, including the newly created *Paracrotaphopeltis* gen. nov., by the following unique suite of characters:

Dorsal scales keeled posteriorly, and with increasing size also anteriorly; 17 or 19 mid-body scale rows, 39-56 subcaudals (males) and 35-54 subcaudals (females); 15-20+II maxillary teeth; hemipenis extending to subcaudal scute no. 7-11 and with an enlarged spine laterally and a somewhat enlarged spine medially in *C. tornieri*, or no hemipenial spines in *C. juliusnyererei* sp. nov.; dorsum pale gray to almost black with various tints of brown and blue; ventrum whitish or cream in juveniles, becoming a paler shade of the dorsal color in adults, the pigment extending progressively further forward as size increases; underside of tail always more or less densely pigmented; upper postocular is not separated from the supraocular by a forward prolongation of the parietal (modified from Rasmussen, 1993).

*C. juliusnyererei* sp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/491820>

and

<https://www.inaturalist.org/observations/60050794>

*C. tornieri* in life is depicted in Spawls *et al.* (2011) on page 380 and online at:

<https://www.flickr.com/photos/rainforests/16125591481/>

and

<https://www.inaturalist.org/observations/132373883>

and

<https://www.inaturalist.org/observations/64591862>

and

<https://www.inaturalist.org/observations/100933240>

*C. tornieri udzungwaensis* subsp. nov. in life is depicted online at: <https://www.flickr.com/photos/euprepiosaur/15679402622/>

and

<https://www.flickr.com/photos/156667445@N07/52656136407/>

and

<https://www.flickr.com/photos/euprepiosaur/15493020720/>

and

<https://www.inaturalist.org/observations/100933240>

and

<https://www.inaturalist.org/observations/147885469>

**Distribution:** *C. ufipaensis* sp. nov. is confined to the Ufipa Plateau, west Tanzania.

**Etymology:** *C. ufipaensis* sp. nov. is named in reflection of where it occurs, being the Ufipa Plateau, west Tanzania.

#### **CROTAPHOPELTIS RONDOENSIS SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:DCA50566-F1BE-486B-9222-30683FE56306**

**Holotype:** A preserved specimen at the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany, specimen number ZFMK 44863, collected from the environs of Lindi, Tanzania, Latitude 9.9876 S., Longitude 39.6982 E.

This facility allows access to its holdings.

**Diagnosis:** *Crotaphopeltis rondoensis* sp. nov. confined to the Rondo Plateau, south-east Tanzania, has until now been treated as a population of the better known *C. tornieri* (Werner, 1908), with a type locality of the Usambara Mountains, north-east Tanzania.

Until now *C. tornieri* has been treated as a composite species, including populations stretching south-west from the type locality to south-west Tanzania and into nearby Malawi.

*Crotaphopeltis juliusnyererei* sp. nov. from Mount Rungwe, Ukinga and environs, Tanzania and the nearby Misuku Mountains in adjacent Malawi has been regarded as a population of *C. tornieri* with which it is both most closely related to and morphologically similar to.

The molecular data of Engelbrecht *et al.* (2020) confirmed that it is a separate species-level taxon.

In the absence of an available name, it is herein formally named *C. juliusnyererei* sp. nov.

*C. juliusnyererei* sp. nov. is separated from *C. tornieri* and the related subspecies *C. tornieri udzungwaensis* subsp. nov. from the nearby Udzungwa Mountains by the following unique suites of characters (in mature adult specimens):

White upper labials; a dull-brownish-orange-grey iris; a dark olive-grey dorsum.

*C. tornieri* of the type form has a greenish head; a bright orange eye, upper labials are also green (slight whitening at the back labials, past the eye); a dark olive-grey dorsum.

*C. tornieri udzungwaensis* subsp. nov. has white upper labials (including below the eye and anterior to it); a bright orange eye; dark olive-to-grey dorsum, separating it from the two previously named taxa (above in this description).

The species *C. ufipaensis* sp. nov. restricted to the Ufipa Plateau area to the west of Lake Rukwa in Tanzania, is morphologically similar in most respects to *C. juliusnyererei* sp. nov. and separated from it by a biogeographical barrier believed to have been present for more than 1 MYA (with a potential minimum of about 700 K years) and also effectively agreed in terms of molecular phylogenies published by Menegon (2014) for snakes of the similarly affected and constrained genus *Atheris* Cope, 1862. It is separated from *C. juliusnyererei* sp. nov. by having a medium olive-grey dorsum (versus darker) and 46 subcaudals in males (single specimen record) versus 37-47 in all populations of *C. juliusnyererei* sp. nov. (21 specimen records).

*C. rondoensis* sp. nov. is similar in most respects to *C. tornieri udzungwaensis* subsp. nov., but with a dull orange to reddish-brown iris and a higher average ventral count in females of 175 (1 specimen counted) versus 172 in *C. tornieri udzungwaensis* subsp. nov. (30 specimens counted) and consistently lower averages in all other species and subspecies within the *C. tornieri* complex as reported by Rasmussen (1993).

*C. rondoensis* sp. nov. occurring in the Rondo Plateau region of southern Tanzania, is self-evidently biogeographically isolated from other populations within the *C. tornieri* complex and is therefore evolving as a separate allopatric species. While there is no time calibrated dating of divergence for this particular taxon, it is common-knowledge that the Rondo Plateau and environs is a region of high endemism in terms of east African fauna, including for example the iconic species *Paragalago rondoensis* (Honest and Bearder, 1997).

The four species, *C. juliusnyererei* sp. nov., *C. ufipaensis* sp. nov., *C. rondoensis* sp. nov. and both subspecies of *C. tornieri* are separated from all others in the genus *Crotaphopeltis* Fitzinger, 1843, including the newly created *Paracrotaphopeltis* gen. nov., by the following unique suite of characters:

Dorsal scales keeled posteriorly, and with increasing size also anteriorly; 17 or 19 mid-body scale rows, 39-56 subcaudals (males) and 35-54 subcaudals (females); 15-20+II maxillary teeth; hemipenis extending to subcaudal scute no. 7-11 and with an enlarged spine laterally and a somewhat enlarged spine medially in *C. tornieri*, or no hemipenial spines in *C. juliusnyererei* sp. nov.; dorsum pale gray to almost black with various tints of brown and blue; ventrum whitish or cream in juveniles, becoming a paler shade of the dorsal color in adults, the pigment extending progressively further forward as size increases; underside of tail always more or less densely pigmented; upper postocular is not separated from the supraocular by a forward prolongation of the parietal (modified from Rasmussen, 1993).

*C. juliusnyererei* sp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/491820>

and

<https://www.inaturalist.org/observations/60050794>

*C. tornieri* in life is depicted in Spawls *et al.* (2011) on page 380 and online at:

<https://www.flickr.com/photos/rainforests/16125591481/>

and

<https://www.inaturalist.org/observations/132373883>

and

<https://www.inaturalist.org/observations/64591862>

and

<https://www.inaturalist.org/observations/100933240>

*C. tornieri udzungwaensis* subsp. nov. in life is depicted online at: <https://www.flickr.com/photos/euprepiosaur/15679402622/>

and

<https://www.flickr.com/photos/156667445@N07/52656136407/>

and

<https://www.flickr.com/photos/euprepiosaur/15493020720/>

and

<https://www.inaturalist.org/observations/100933240>

and

<https://www.inaturalist.org/observations/147885469>

**Distribution:** *C. rondoensis* sp. nov. is confined to the Rondo Plateau and immediate environs, west Tanzania.

**Etymology:** *C. rondoensis* sp. nov. is named in reflection of where it occurs, being the Rondo Plateau, west Tanzania, near Lindi on the Indian Ocean coast.

**CROTAPHOPELTIS TORNIERI UZUNGWAESENSIS SUBSP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:F46E3D75-3C2D-498B-BBCE-2581E643DA67

**Holotype:** A preserved specimen at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen number ZMUC-R63985 collected from Mwanihana Forest, Udzungwa Mountains, Tanzania, Latitude -7.833333 S., Longitude 36.916666 E.

This facility allows access to its holdings.

**Paratypes:** Preserved specimens at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen numbers ZMUC-R63983, R631031-R631040, R631079-R631116, R631119, R631240, R631243-R631256, R631272-R631274 all collected from the Udzungwa Mountains, Tanzania.

**Diagnosis:** Until now *Crotaphopeltis tornieri* (Werner, 1908), with a type locality of the Usambara Mountains, north-east Tanzania, has been treated as a composite species, including populations stretching south-west from the type locality to south-west Tanzania and into nearby Malawi.

*Crotaphopeltis juliusnyererei* sp. nov. from Mount Rungwe, Ukinga and environs, Tanzania and the nearby Misuku Mountains in adjacent Malawi has been regarded as a population of *C. tornieri* with which it is both most closely related to and morphologically similar to.

The molecular data of Engelbrecht *et al.* (2020) confirmed that it is a separate species-level taxon.

In the absence of an available name, it is herein formally named *C. juliusnyererei* sp. nov.

*C. juliusnyererei* sp. nov. is separated from *C. tornieri* and the related subspecies *C. tornieri udzungwaensis* subsp. nov. from the nearby Udzungwa Mountains by the following unique suites of characters (in mature adult specimens):

White upper labials; a dull-brownish-orange-grey iris; a dark olive-grey dorsum.

*C. tornieri* of the type form has a greenish head; a bright orange eye, upper labials are also green (slight whitening at the back labials, past the eye); a dark olive-grey dorsum.

*C. tornieri udzungwaensis* subsp. nov. has white upper labials (including below the eye and anterior to it); a bright orange eye; dark olive-to-grey dorsum, separating it from the two previously named taxa (above in this description).

The species *C. ufipaensis* sp. nov. restricted to the Ufipa Plateau area to the west of Lake Rukwa in Tanzania, is similar in most respects to *C. juliusnyererei* sp. nov. and separated from it by a biogeographical barrier believed to have been present for more than 1 MYA (with a potential minimum of about 700 K years) and also effectively agreed in terms of molecular phylogenies published by Menegon (2014) for snakes of the similarly affected and constrained genus *Atheris* Cope, 1862.

It is separated from *C. juliusnyererei* sp. nov. by having a medium olive-grey dorsum (versus darker) and 46 subcaudals in males (single specimen record) versus 37-47 in all populations of *C. juliusnyererei* sp. nov. (21 specimen records).

*C. rondoensis* sp. nov. is similar in most respects to *C. tornieri udzungwaensis* subsp. nov., but with a dull orange to reddish-brown iris and a higher average ventral count in females of 175 (1 specimen counted) versus 172 in *C. tornieri udzungwaensis* subsp. nov. (30 specimens counted) and consistently lower averages in all other species and subspecies within the *C. tornieri* complex as reported by Rasmussen (1993).

*C. rondoensis* sp. nov. occurring in the Rondo Plateau region of southern Tanzania, is self-evidently biogeographically isolated from other populations within the *C. tornieri* complex and is therefore evolving as a separate allopatric species.

While there is no time calibrated dating of divergence for this particular taxon, it is common-knowledge that the Rondo Plateau and environs is a region of high endemism in terms of east African fauna, including for example the iconic species

*Paragalago rondoensis* (Honest and Bearder, 1997).

The four species, *C. juliusnyererei* sp. nov., *C. ufipaensis* sp. nov., *C. rondoensis* sp. nov. and both subspecies of *C. tornieri* are separated from all others in the genus *Crotaphopeltis* Fitzinger, 1843, including the newly created *Paracrotaphopeltis* gen. nov., by the following unique suite of characters:

Dorsal scales keeled posteriorly, and with increasing size also anteriorly; 17 or 19 mid-body scale rows, 39-56 subcaudals (males) and 35-54 subcaudals (females); 15-20+II maxillary teeth; hemipenis extending to subcaudal scute no. 7-11 and with an enlarged spine laterally and a somewhat enlarged spine medially in *C. tornieri*, or no hemipenial spines in *C. juliusnyererei* sp. nov.; dorsum pale gray to almost black with various tints of brown and blue; ventrum whitish or cream in juveniles, becoming a paler shade of the dorsal color in adults, the pigment extending progressively further forward as size increases; underside of tail always more or less densely pigmented; upper postocular is not separated from the supraocular by a forward prolongation of the parietal (modified from Rasmussen, 1993).

*C. juliusnyererei* sp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/491820>

and

<https://www.inaturalist.org/observations/60050794>

*C. tornieri* in life is depicted in Spawls *et al.* (2011) on page 380 and online at:

<https://www.flickr.com/photos/rainforests/16125591481/>

and

<https://www.inaturalist.org/observations/132373883>

and

<https://www.inaturalist.org/observations/64591862>

and

<https://www.inaturalist.org/observations/100933240>

*C. tornieri udzungwaensis* subsp. nov. in life is depicted online at:

<https://www.flickr.com/photos/euprepiosaur/1567940262/>

and

<https://www.flickr.com/photos/156667445@N07/52656136407/>

and

<https://www.flickr.com/photos/euprepiosaur/15493020720/>

and

<https://www.inaturalist.org/observations/100933240>

and

<https://www.inaturalist.org/observations/147885469>

**Distribution:** *C. tornieri udzungwaensis* subsp. nov. appears to be a taxon restricted to the Udzungwa Mountains, Tanzania. West of here at Mount Rungwe, Ukinga and environs, Tanzania and the nearby Misuku Mountains in adjacent Malawi is *C. juliusnyererei* sp. nov.

North east of the Udzungwa Mountains, Tanzania, but within Tanzania, the morphologically similar *C. tornieri* of the nominate form occurs.

**Etymology:** *C. tornieri udzungwaensis* subsp. nov. is named in reflection of where it occurs, being the Udzungwa Mountains, Tanzania.

**CROTAPHOPELTIS HOTAMBOEIA RUBRUMLABELLUM SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:04DFB00A-B950-4814-93E3-CB0EECB1BFF9**

**Holotype:** A preserved specimen at the California Academy of Sciences, San Francisco, California, USA, specimen number CAS HERP 125674, collected from a farm at Bokfontein, 9 miles south-west of Brits, Transvaal Province, South Africa.

This facility allows access to its holdings.

**Paratypes:** 1/ A preserved specimen at the Herpetology Collection in the Museum of Vertebrate Zoology, University

of California, Berkeley, California, USA, specimen number MVZ:Herp:69414, collected from 4.5 miles North west of Johannesburg, Transvaal, South Africa, Latitude -26.2 S., Longitude 28.083333 E.

2/ A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp R-46413 collected from Fountains, Pretoria, Transvaal, South Africa, Latitude -25.707 S., Longitude 28.229 E.

**Diagnosis:** Until now, most herpetologists have treated the Herald-Snake, locally known as the Red-lipped Snake in north-east South Africa as a single-wide-ranging taxon found in most parts of sub-Saharan Africa. Engelbrecht *et al.* (2020), found there were six well defined clades of *Crotaphopeltis hotamboeia* (Laurenti, 1768) found in various parts of Africa. They decided that the divergences between each did not warrant species-level division, based on timelines of divergence and potential admixture of populations in zones of contact between clades.

However they also wrote that: "*Intraspecific diversification for C. hotamboeia, however, commenced during the Miocene-Pliocene transition period, ca. 6 Mya (Engelbrecht, 2017)*", which is a time frame of divergence that would normally warrant species-level divisions.

In light of the preceding it is appropriate that each morphologically diagnosable clade is taxonomically recognized as a subspecies within *C. hotamboeia*.

The six subspecies are as follows:

1/ The nominate form of *C. hotamboeia*, herein called *C. hotamboeia hotamboeia* occurs in the far south of South Africa, being found from along the coast from around Cape Town in the West, east to about Durban and north to about Lesotho. This corresponds with Clade 4 in Engelbrecht *et al.* (2020).

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) from the Ruzizi-Kivu basin in Democratic Republic of the Congo corresponds to Clade 3 of Engelbrecht *et al.* (2020) and so is also already named. This is the most widespread subspecies and found in most parts of sub-Saharan Africa, except for the far south (South Africa and the countries that border it) as well as being absent from large parts of east Africa below the horn of Africa.

3/ *C. hotamboeia rubrumlabellum* subsp. nov. occurs from Lesotho and north in South Africa and corresponds with Clade 5 of Engelbrecht *et al.* (2020).

4/ *C. hotamboeia luteuslabellum* subsp. nov. is found around Eswatini, previously known as Swaziland, adjacent parts of north-east South Africa as well as most parts of Mozambique. It corresponds with clade 6 of Engelbrecht *et al.* (2020).

5/ *C. hotamboeia labellumpulvereus* subsp. nov. is found generally west of Kinshasa, Democratic Republic of Congo (DRC) in north-west Angola, including, nearby DRC, Congo (Brazzaville) and south west Gabon. It corresponds with clade 2 of Engelbrecht *et al.* (2020).

6/ *C. hotamboeia albalinguacallosus* subsp. nov. is known only from south-east Kenya. It corresponds with clade 1 of Engelbrecht *et al.* (2020).

The six subspecies are separated from one another by the following unique suites of characters:

1/ *C. hotamboeia hotamboeia* has upper labials that are an immaculate creamy white, almost to the eye, sometimes duller anteriorly. The tongue is dark blue, with the forked tips being white. The dorsum is yellowish-brown to light grey brown. Tiny white spots on the dorsum are mainly rectangular in shape or close to it and not particularly prominent in juveniles. Iris is yellowish to yellowish-grey or beige. One or two postoculars present and if two, both of the same width, First temporal is round edged (half oval) on the upper edge and rectangular on the lower edges.

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) is morphologically similar in most respects to *C. h. hotamboeia* but separated from



this and the other subspecies by having a brown iris, pink, or mainly pink tongue including the forked tips, but sometimes spotted or marked with blue or red on parts, usually (but not always) a greyish tinge or hue on the dorsum, which is otherwise light brown or rarely steel-grey; tiny white spots on the dorsum are mainly oval in shape or similar and they are prominent in juveniles. Upper labials are light brown and sometimes with one or more irregular white bars or spots.

3/ *C. hotamboeia rubrumlabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are distinctive and bold orangeish-red colour that extends virtually to the eye and at the same level up, posterior to it on the sides. The only subspecies likely to be confused with this one is the morphologically similar *C. hotamboeia luteuslabellum subsp. nov.*, which has a slightly less intense orange on the upper labials, but in this case, the area of orange (bright colour) extends upwards to be level with the mid-eye, which is not the case in *C. hotamboeia rubrumlabellum subsp. nov.*.

*C. hotamboeia rubrumlabellum subsp. nov.* is further separated from the other five subspecies by the following characters: limited grey peppering on the upper orange-red parts of the upper labials; white spotting on the dorsum is either absent or barely visible in adults, a brownish-red dorsum, first temporal, which is more-or-less rectangular in shape, is twice as long as wide (versus 3 times in *C. hotamboeia luteuslabellum subsp. nov.*), and a mainly blue tongue with white tips. The iris is olive-grey-brown, with orange at the far outer edges.

The two postoculars are of similar width or broadness to one another, although in height the top one is about double that of the lower, making it about double the size.

4/ *C. hotamboeia luteuslabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are a distinctive and bold orange colour that extends virtually to the eye and then higher than the eye posterior to it on the sides. This is by way of an expansion in width of the marking, this expansion not being present in the otherwise similar looking *C. hotamboeia rubrumlabellum subsp. nov.*.

*C. hotamboeia luteuslabellum subsp. nov.* is further separated from the other five subspecies by the following characters: no grey peppering on the upper orange parts of the upper labials; white spotting on the dorsum is usually obvious and prominently visible in most adults, a reddish-grey dorsum, first temporal, which is more-or-less rectangular in shape, is three times as long as wide (versus twice as long as wide in *C. hotamboeia luteuslabellum subsp. nov.* due to the temporal scale being far wider), and a mainly blue tongue with white tips. The iris is dull orange in colour all over.

The two postoculars are of similar width or broadness to one another, although in height the top one and lower one are of about the same size.

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is readily separated from the other species by having whitish upper labials, that are peppered grey-brown (yellowish anteriorly); a dorsum that has a chocolate brown base colour, or slightly lighter, white spotting visible in adults, but instead of forming a cross-band type pattern as seen in specimens of other subspecies, in this taxon are usually sufficiently sparse, to merely appear as scattered tiny spots, these tiny white spots being mainly circular in shape. Iris is a dull brown and tongue is a bluish-grey colour, except at the extremities, where it is whitish at the very outer tips only and light grey at the base. The dark blackish markings on the temples at the back of the head, which range from distinct to semi-distinct in the other subspecies are invariably faded in this subspecies, sometimes making them of the same colour and indistinguishable from the surrounding chocolate brown.

The two postoculars are of unequal size, the bottom one tiny and top one being huge, pushing well into the first temporal shield, making the bottom of the anterior edge angular, making the anterior half of the scale triangular in shape (square edged at the

posterior edge).

6/ *C. hotamboeia albalinguacaloso subsp. nov.* is separated from the other subspecies by a dorsum that is purplish brown in colour and a pale tongue that is usually whitish along the entire length, although sometimes with patches of pinkish, purple or blue pigment on the mid-section. White spotting on the dorsum with relatively large, tiny white spots (on average larger than in any other subspecies) remain prominent in adults. Iris is purplish gold and the two postoculars are of similar size.

The species *C. hotamboeia* including all subspecies, are separated from all other species within the genus *Crotaphopeltis* Fitzinger, 1843 and the related genus *Paracrotaphopeltis gen. nov.* by the following suite of characters: 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly. The most similar species morphologically are those four species in the *C. tornieri* (Werner, 1908) complex (being *C. andreeblouinae sp. nov.*, *C. juliusnyererei sp. nov.*, *C. ufipaensis sp. nov.* and *C. rondoensis sp. nov.*), all of which have 17-17-15 dorsal mid body rows and likewise have dorsal scales that are feebly keeled posteriorly (versus smooth in the other species in *Crotaphopeltis*).

*C. hotamboeia* is further separated from the *C. tornieri* complex by having a frontal that is 1.4 to 1.6 times as long as wide, versus 1.1-1.3 in the other species.

*C. hotamboeia* is further defined as follows:

An African savanna living species of *Crotaphopeltis* with the following character combination: body cylindrical; tail short (11-15 percent of total length); 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly; 12-18+II+1 maxillary teeth; 139-181 ventrals; single anal; divided subcaudals, being 31-57 in males and 25-51 in females; hemipenis extending to sub caudal number 7 to 13 and with three distinctly enlarged, stout, proximal spines; dorsum various shades of grey, brown, olive or black, usually with scattered white specks which may tend to form transverse bands in juveniles and subadults; temple usually with a dark, bluish-black or purplish-black mark which may extend backwards to encircle the occiput and reach the last, or the last and penultimate, and rarely also the antepenultimate infralabial; venter and underside of tail white, cream or pale brown, exceptionally with some dark pigmentation; average snout-vent length is 45-65 cm (mainly modified from Rasmussen *et al.* 2000).

Snakes of the genera *Crotaphopeltis* Fitzinger, 1843 and *Paracrotaphopeltis gen. nov.* (the latter until now included in *Crotaphopeltis*) are separated from all other African snake genera (all families) by the following unique suite of characters:

One or more pairs of hollow grooved fangs at the rear of the mouth on the upper jaw; no fangs at the front of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular and not marbled red brown, white or yellow; 141-183 ventrals; body not worm-like; body not vertically flattened in any way, or thick and muscular.

The monotypic genus *Paracrotaphopeltis gen. nov.* is separated from the morphologically similar genus *Crotaphopeltis* Fitzinger, 1843 by the following unique suite of characters: A relatively narrow head, with a high rostral and no expansion of the temporal region. It is further separated from all species of *Crotaphopeltis* by having the upper postocular separated from the supraocular by a forward prolongation of the parietal, which enters the orbit. Dorsal scale rows are 17-17-13, versus 17-19-15 rows, 21-19-15 rows or 17-17-15 rows in *Crotaphopeltis* species. Scales dorsally are completely smooth (modified from Broadley, 1968).

Images of the six subspecies can be found online as follows:

1/ *C. hotamboeia hotamboeia* in life is depicted online at:

<https://www.inaturalist.org/observations/131382831>

and

<https://www.inaturalist.org/observations/157650371>

and

<https://www.inaturalist.org/observations/146067325>

2/ *C. hotamboeia ruzizensis* in life is depicted online at:

<https://www.inaturalist.org/observations/130288>

and

<https://www.inaturalist.org/observations/125957875>

3/ *C. hotamboeia rubrumlabellum subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/67403752>

and

<https://www.inaturalist.org/observations/73598282>

and

<https://www.inaturalist.org/observations/106671151>

4/ *C. hotamboeia luteuslabellum subsp. nov.* in life is depicted online at:

<https://www.flickr.com/photos/cowyeow/5494238278>

and

<https://www.inaturalist.org/observations/468291>

and

<https://www.inaturalist.org/observations/112123534>

and

<https://www.inaturalist.org/observations/129379206>

and

<https://www.inaturalist.org/observations/63795880>

5/ *C. hotamboeia labellumpulvereus subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/51220863>

6/ *C. hotamboeia albalinguacaloso subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/71639217>

**Behavioural Notes:** Broadley (1968) described *C. hotamboeia* as “irascible and vicious”.

Irascible, according to “Google” on 22 Feb 2023, means having or showing a tendency to be easily angered.

Broadley’s claim with regards to *C. hotamboeia* is untrue.

Having caught dozens of *C. hotamboeia* in the field, as well as having held dozens of them captives for some weeks in 2009, I note that in spite of extensive handling by myself and many others, not one ever attempted to bite.

All were simply scooped up in hands when caught or handled and none ever bit!

While they commonly rear up and flatten the rear of their head in what seems to be a defensive posture, these snakes are notable in not actually ever biting.

Dozens of these snakes were used in educational school reptile shows in South Africa (mainly in the Cape Town area). They were handed out to literally thousands of children who had never handled snakes in their lives. At these educational lectures, the kids spent a lot of time walking around holding the snakes, passing them to one another, along with house snakes (*Boaedon spp.*) and others and not one was ever bitten!

However the snake I had the greatest number of at the time for these displays was in fact *C. hotamboeia*, as I had earlier found and caught just over 100 on a floodplain west of Vangate Drive, Philippi (on the outskirts of Cape Town, South Africa) after flooding winter rains in less than 3 hours of searching (and then I caught others elsewhere). Most of the snakes were caught in cold weather hiding under broken bits of chipboard on the sodden ground. They were usually found singly, hence proving that these snakes at least prefer to spend their time out of the company of their own kind.

Following the above-mentioned educational school reptile shows,

the snakes were all later released.

An identical behaviour pattern of an agitated snake rearing up and flattening the head as if to strike, but never actually doing so is found in the Australian Golden Crowned Snakes *Cacophis squamulosus* (Duméril, Bibron and Duméril, 1854).

Over a fifty year period, I have caught hundreds of specimens, simply by scooping them up in my bare hands and none have ever bitten. Most were caught at night crossing roads, although large numbers were found over many years and under rocks and tree bark by day in and around the greater Sydney region in New South Wales, Australia.

Donald Broadley (of South Africa), along with his close friends Wolfgang Wuster, Bill Branch and Mark O’Shea for decades marketed themselves as poster-boys for metal snake tongs, which they then sold online to gullible customers that are probably better described as victims.

These barbaric tools are used to grab snakes and hold them in a vice-like grip.

They use these tools because of an improper fear of being bitten by what is in this case an effectively harmless snake in terms of adult humans.

Invariably the use of the tongs breaks and damages ribs and/or internal organs. Commonly the outcome is fatal (Hoser 2007b).

Of course, as a snake is having its insides destroyed and it is in excruciating pain, it is simply natural that it would become “irascible and vicious”.

But to describe *C. hotamboeia* as being “irascible and vicious” in terms of the normal temperament for this species of snake is clearly untrue.

I note that the preceding behavioural observations were specific to the type form of *C. hotamboeia*, but have also experienced the same situation when handling specimens of other subspecies, including both other South African forms (*C. hotamboeia rubrumlabellum subsp. nov.* and *C. hotamboeia luteuslabellum subsp. nov.*) and so treat it as standard for all subspecies.

**Distribution:** *C. hotamboeia rubrumlabellum subsp. nov.* occurs from Lesotho and north in South Africa and corresponds with Clade 5 of Engelbrecht *et al.* (2020).

**Etymology:** *C. hotamboeia rubrumlabellum subsp. nov.* is named in reflection of the Latin words “rubrum labellum” which means “red lips” in reflection of the dark red upper labials that are diagnostic of this subspecies.

**CROTAPHOPELTIS HOTAMBOEIA LUTEUSLABELLUM SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:48D98DCD-E9BE-459D-AAFD-32F96FAC1F07**

**Holotype:** A preserved specimen at the California Academy of Sciences, San Francisco, California, USA, specimen number CAS HERP 248648, collected from 13.5 km south west of Phalaborwa, along Hwy 40 from Phalaborwa to Hoedspruit, Limpopo Province, South Africa, Latitude -24.037972 S., Longitude 31.049 E.

This facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the California Academy of Sciences, San Francisco, California, USA, specimen numbers CAS HERP 248643 collected from Cleveland Nature Reserve, south east of Phalaborwa, Limpopo Province, South Africa, Latitude 24.0002 S. Longitude 31.1202.3 E., and CAS HERP 248636 collected from 28 km south-west of Phalaborwa, along Hwy 40 from Phalaborwa to Hoedspruit, Limpopo Province, South Africa, Latitude 24.0439 S., Longitude 30.5423 E.

**Diagnosis:** Until now, most herpetologists have treated the Herald-Snake, locally known as the Red-lipped Snake in north-east South Africa as a single-wide-ranging taxon found in most parts of sub-Saharan Africa. Engelbrecht *et al.* (2020), found there were six well defined clades of *Crotaphopeltis hotamboeia*

(Laurenti, 1768) found in various parts of Africa. They decided that the divergences between each did not warrant species-level division, based on timelines of divergence and potential admixture of populations in zones of contact between clades.

However they also wrote that: “*Intraspecific diversification for C. hotamboeia, however, commenced during the Miocene-Pliocene transition period, ca. 6 Mya (Engelbrecht, 2017)*”, which is a time frame of divergence that would normally warrant species-level divisions.

In light of the preceding it is appropriate that each morphologically diagnosable clade is taxonomically recognized as a subspecies within *C. hotamboeia*.

The six subspecies are as follows:

1/ The nominate form of *C. hotamboeia*, herein called *C. hotamboeia hotamboeia* occurs in the far south of South Africa, being found from along the coast from around Cape Town in the West, east to about Durban and north to about Lesotho. This corresponds with Clade 4 in Engelbrecht *et al.* (2020).

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) from the Ruzizi-Kivu basin in Democratic Republic of the Congo corresponds to Clade 3 of Engelbrecht *et al.* (2020) and so is also already named. This is the most widespread subspecies and found in most parts of sub-Saharan Africa, except for the far south (South Africa and the countries that border it) as well as being absent from large parts of east Africa below the horn of Africa.

3/ *C. hotamboeia rubrumlabellum subsp. nov.* occurs from Lesotho and north in South Africa and corresponds with Clade 5 of Engelbrecht *et al.* (2020).

4/ *C. hotamboeia luteuslabellum subsp. nov.* is found around Eswatini, previously known as Swaziland, adjacent parts of north-east South Africa as well as most parts of Mozambique. It corresponds with clade 6 of Engelbrecht *et al.* (2020).

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is found generally west of Kinshasa, Democratic Republic of Congo (DRC) in north-west Angola, including, nearby DRC, Congo (Brazzaville) and south west Gabon. It corresponds with clade 2 of Engelbrecht *et al.* (2020).

6/ *C. hotamboeia albalinguacallosa subsp. nov.* is known only from south-east Kenya. It corresponds with clade 1 of Engelbrecht *et al.* (2020).

The six subspecies are separated from one another by the following unique suites of characters:

1/ *C. hotamboeia hotamboeia* has upper labials that are an immaculate creamy white, almost to the eye, sometimes duller anteriorly. The tongue is dark blue, with the forked tips being white. The dorsum is yellowish-brown to light grey brown. Tiny white spots on the dorsum are mainly rectangular in shape or close to it and not particularly prominent in juveniles. Iris is yellowish to yellowish-grey or beige. One or two postoculars present and if two, both of the same width, First temporal is round edged (half oval) on the upper edge and rectangular on the lower edges.

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) is morphologically similar in most respects to *C. h. hotamboeia* but separated from this and the other subspecies by having a brown iris, pink, or mainly pink tongue including the forked tips, but sometimes spotted or marked with blue or red on parts, usually (but not always) a greyish tinge or hue on the dorsum, which is otherwise light brown or rarely steel-grey; tiny white spots on the dorsum are mainly oval in shape or similar and they are prominent in juveniles. Upper labials are light brown and sometimes with one or more irregular white bars or spots.

3/ *C. hotamboeia rubrumlabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are distinctive and bold orangeish-red colour that extends virtually to the eye and at the same level up, posterior to it on the sides. The only subspecies likely to be confused with this one is the morphologically similar *C. hotamboeia luteuslabellum*

*subsp. nov.*, which has a slightly less intense orange on the upper labials, but in this case, the area of orange (bright colour) extends upwards to be level with the mid-eye, which is not the case in *C. hotamboeia rubrumlabellum subsp. nov.*

*C. hotamboeia rubrumlabellum subsp. nov.* is further separated from the other five subspecies by the following characters: limited grey peppering on the upper orange-red parts of the upper labials; white spotting on the dorsum is either absent or barely visible in adults, a brownish-red dorsum, first temporal, which is more-or-less rectangular in shape, is twice as long as wide (versus 3 times in *C. hotamboeia luteuslabellum subsp. nov.*), and a mainly blue tongue with white tips. The iris is olive-grey-brown, with orange at the far outer edges.

The two postoculars are of similar width or broadness to one another, although in height the top one is about double that of the lower, making it about double the size.

4/ *C. hotamboeia luteuslabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are a distinctive and bold orange colour that extends virtually to the eye and then higher than the eye posterior to it on the sides. This is by way of an expansion in width of the marking, this expansion not being present in the similar looking *C. hotamboeia rubrumlabellum subsp. nov.*

*C. hotamboeia luteuslabellum subsp. nov.* is further separated from the other five subspecies by the following characters: no grey peppering on the upper orange parts of the upper labials; white spotting on the dorsum is usually obvious and prominently visible in most adults, a reddish-grey dorsum, first temporal, which is more-or-less rectangular in shape, is three times as long as wide (versus twice as long as wide in *C. hotamboeia luteuslabellum subsp. nov.* due to the temporal scale being far wider), and a mainly blue tongue with white tips. The iris is dull orange in colour all over.

The two postoculars are of similar width or broadness to one another, although in height the top one and lower one are of about the same size.

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is readily separated from the other species by having whitish upper labials, that are peppered grey-brown (yellowish anteriorly); a dorsum that has a chocolate brown base colour, or slightly lighter, white spotting visible in adults, but instead of forming a cross-band type pattern as seen in specimens of other subspecies, in this taxon are usually sufficiently sparse, to merely appear as scattered tiny spots, these tiny white spots being mainly circular in shape. Iris is a dull brown and tongue is a bluish-grey colour, except at the extremities, where it is whitish at the very outer tips only and light grey at the base. The dark blackish markings on the temples at the back of the head, which range from distinct to semi-distinct in the other subspecies are invariably faded in this subspecies, sometimes making them of the same colour and indistinguishable from the surrounding chocolate brown.

The two postoculars are of unequal size, the bottom one tiny and top one being huge, pushing well into the first temporal shield, making the bottom of the anterior edge angular, making the anterior half of the scale triangular in shape (square edged at the posterior edge).

6/ *C. hotamboeia albalinguacallosa subsp. nov.* is separated from the other subspecies by a dorsum that is purplish brown in colour and a pale tongue that is usually whitish along the entire length, although sometimes with patches of pinkish, purple or blue pigment on the mid-section. White spotting on the dorsum with relatively large, tiny white spots (on average larger than in any other subspecies) remain prominent in adults. Iris is purplish gold and the two postoculars are of similar size.

The species *C. hotamboeia* including all subspecies, are separated from all other species within the genus *Crotaphopeltis* Fitzinger, 1843 and the related genus *Paracrotaphopeltis gen. nov.* by the following suite of characters: 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly. The

most similar species morphologically are those four species in the *C. tornieri* (Werner, 1908) complex (being *C. andreeblouinae* sp. nov., *C. juliusnyererei* sp. nov., *C. ufiensis* sp. nov. and *C. rondoensis* sp. nov.), all of which have 17-17-15 dorsal mid body rows and likewise have dorsal scales that are feebly keeled posteriorly (versus smooth in the other species in *Crotaphopeltis*).

*C. hotamboeia* is further separated from the *C. tornieri* complex by having a frontal that is 1.4 to 1.6 times as long as wide, versus 1.1-1.3 in the other species.

*C. hotamboeia* is further defined as follows:

An African savanna living species of *Crotaphopeltis* with the following character combination: body cylindrical; tail short (11-15 percent of total length); 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly; 12-18+1+1 maxillary teeth; 139-181 ventrals; single anal; divided subcaudals, being 31-57 in males and 25-51 in females; hemipenis extending to sub caudal number 7 to 13 and with three distinctly enlarged, stout, proximal spines; dorsum various shades of grey, brown, olive or black, usually with scattered white specks which may tend to form transverse bands in juveniles and subadults; temple usually with a dark, bluish-black or purplish-black mark which may extend backwards to encircle the occiput and reach the last, or the last and penultimate, and rarely also the antepenultimate infralabial; venter and underside of tail white, cream or pale brown, exceptionally with some dark pigmentation; average snout-vent length is 45-65 cm (mainly modified from Rasmussen *et al.* 2000).

Snakes of the genera *Crotaphopeltis* Fitzinger, 1843 and *Paracrotaphopeltis* gen. nov. (the latter until now included in *Crotaphopeltis*) are separated from all other African snake genera (all families) by the following unique suite of characters:

One or more pairs of hollow grooved fangs at the rear of the mouth on the upper jaw; no fangs at the front of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular and not marbled red brown, white or yellow; 141-183 ventrals; body not worm-like; body not vertically flattened in any way, or thick and muscular.

Images of the six subspecies can be found online as follows:

1/ *C. hotamboeia hotamboeia* in life is depicted online at:

<https://www.inaturalist.org/observations/131382831>

and

<https://www.inaturalist.org/observations/157650371>

and

<https://www.inaturalist.org/observations/146067325>

2/ *C. hotamboeia ruziziensis* in life is depicted online at:

<https://www.inaturalist.org/observations/130288>

and

<https://www.inaturalist.org/observations/125957875>

3/ *C. hotamboeia rubrumlabellum* subsp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/67403752>

and

<https://www.inaturalist.org/observations/73598282>

and

<https://www.inaturalist.org/observations/106671151>

4/ *C. hotamboeia luteuslabellum* subsp. nov. in life is depicted online at:

<https://www.flickr.com/photos/cowyeow/5494238278>

and

<https://www.inaturalist.org/observations/468291>

and

<https://www.inaturalist.org/observations/112123534>

and

<https://www.inaturalist.org/observations/129379206>

and

<https://www.inaturalist.org/observations/63795880>

5/ *C. hotamboeia labellumpulvereus* subsp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/51220863>

6/ *C. hotamboeia albalinguacallosus* subsp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/71639217>

**Behavioural Notes:** See the previous description of *C. hotamboeia rubrumlabellum* subsp. nov.

**Distribution:** *C. hotamboeia luteuslabellum* subsp. nov. is found around Eswatini, previously known as Swaziland, adjacent parts of north-east South Africa as well as most parts of Mozambique.

**Etymology:** *C. hotamboeia luteuslabellum* subsp. nov. is named after the Latin words "luteus labellum" meaning orange lips, in recognition of the bright orange upper labials that are diagnostic of this taxon.

**CROTAPHOPELTIS HOTAMBOEIA LABELLUMPULVEREUS SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:176C736B-46D9-4B7C-96AB-594CE1C47153**

**Holotype:** A preserved specimen at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen number ZMUC-R631177 collected from Koubotchi, Republic of the Congo (Brazzaville), Latitude -4.316666 S., Longitude 11.800000 E.

This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen number ZMUC-R631178 collected from Koubotchi, Republic of the Congo (Brazzaville), Latitude -4.316666 S., Longitude 11.800000 E.

**Diagnosis:** Until now, most herpetologists have treated the Herald-Snake, locally known as the Red-lipped Snake in north-east South Africa as a single-wide-ranging taxon found in most parts of sub-Saharan Africa. Engelbrecht *et al.* (2020), found there were six well defined clades of *Crotaphopeltis hotamboeia* (Laurenti, 1768) found in various parts of Africa. They decided that the divergences between each did not warrant species-level division, based on timelines of divergence and potential admixture of populations in zones of contact between clades.

However they also wrote that: "*Intraspecific diversification for C. hotamboeia, however, commenced during the Miocene-Pliocene transition period, ca. 6 Mya (Engelbrecht, 2017)*", which is a time frame of divergence that would normally warrant species-level divisions.

In light of the preceding it is appropriate that each morphologically diagnosable clade is taxonomically recognized as a subspecies within *C. hotamboeia*.

The six subspecies are as follows:

1/ The nominate form of *C. hotamboeia*, herein called *C. hotamboeia hotamboeia* occurs in the far south of South Africa, being found from along the coast from around Cape Town in the West, east to about Durban and north to about Lesotho. This corresponds with Clade 4 in Engelbrecht *et al.* (2020).

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) from the Ruzizi-Kivu basin in Democratic Republic of the Congo corresponds to Clade 3 of Engelbrecht *et al.* (2020) and so is also already named. This is the most widespread subspecies and found in most parts of sub-Saharan Africa, except for the far south (South Africa and the countries that border it) as well as being absent from large parts of east Africa below the horn of Africa.

3/ *C. hotamboeia rubrumlabellum* subsp. nov. occurs from

Lesotho and north in South Africa and corresponds with Clade 5 of Engelbrecht *et al.* (2020).

4/ *C. hotamboeia luteuslabellum subsp. nov.* is found around Eswatini, previously known as Swaziland, adjacent parts of north-east South Africa as well as most parts of Mozambique. It corresponds with clade 6 of Engelbrecht *et al.* (2020).

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is found generally west of Kinshasa, Democratic Republic of Congo (DRC) in north-west Angola, including, nearby DRC, Congo (Brazzaville) and south west Gabon. It corresponds with clade 2 of Engelbrecht *et al.* (2020).

6/ *C. hotamboeia albalinguacallosus subsp. nov.* is known only from south-east Kenya. It corresponds with clade 1 of Engelbrecht *et al.* (2020).

The six subspecies are separated from one another by the following unique suites of characters:

1/ *C. hotamboeia hotamboeia* has upper labials that are an immaculate creamy white, almost to the eye, sometimes duller anteriorly. The tongue is dark blue, with the forked tips being white. The dorsum is yellowish-brown to light grey brown. Tiny white spots on the dorsum are mainly rectangular in shape or close to it and not particularly prominent in juveniles. Iris is yellowish to yellowish-grey or beige. One or two postoculars present and if two, both of the same width, First temporal is round edged (half oval) on the upper edge and rectangular on the lower edges.

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) is morphologically similar in most respects to *C. h. hotamboeia* but separated from this and the other subspecies by having a brown iris, pink, or mainly pink tongue including the forked tips, but sometimes spotted or marked with blue or red on parts, usually (but not always) a greyish tinge or hue on the dorsum, which is otherwise light brown or rarely steel-grey; tiny white spots on the dorsum are mainly oval in shape or similar and they are prominent in juveniles. Upper labials are light brown and sometimes with one or more irregular white bars or spots.

3/ *C. hotamboeia rubrumlabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are distinctive and bold orangeish-red colour that extends virtually to the eye and at the same level up, posterior to it on the sides. The only subspecies likely to be confused with this one is the morphologically similar *C. hotamboeia luteuslabellum subsp. nov.*, which has a slightly less intense orange on the upper labials, but in this case, the area of orange (bright colour) extends upwards to be level with the mid-eye, which is not the case in *C. hotamboeia rubrumlabellum subsp. nov.*

*C. hotamboeia rubrumlabellum subsp. nov.* is further separated from the other five subspecies by the following characters: limited grey peppering on the upper orange-red parts of the upper labials; white spotting on the dorsum is either absent or barely visible in adults, a brownish-red dorsum, first temporal, which is more-or-less rectangular in shape, is twice as long as wide (versus 3 times in *C. hotamboeia luteuslabellum subsp. nov.*), and a mainly blue tongue with white tips. The iris is olive-grey-brown, with orange at the far outer edges.

The two postoculars are of similar width or broadness to one another, although in height the top one is about double that of the lower, making it about double the size.

4/ *C. hotamboeia luteuslabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are a distinctive and bold orange colour that extends virtually to the eye and then higher than the eye posterior to it on the sides. This is by way of an expansion in width of the marking, this expansion not being present in the similar looking *C. hotamboeia rubrumlabellum subsp. nov.*

*C. hotamboeia luteuslabellum subsp. nov.* is further separated from the other five subspecies by the following characters: no grey peppering on the upper orange parts of the upper labials; white spotting on the dorsum is usually obvious and prominently

visible in most adults, a reddish-grey dorsum, first temporal, which is more-or-less rectangular in shape, is three times as long as wide (versus twice as long as wide in *C. hotamboeia luteuslabellum subsp. nov.* due to the temporal scale being far wider), and a mainly blue tongue with white tips. The iris is dull orange in colour all over.

The two postoculars are of similar width or broadness to one another, although in height the top one and lower one are of about the same size.

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is readily separated from the other species by having whitish upper labials, that are peppered grey-brown (yellowish anteriorly); a dorsum that has a chocolate brown base colour, or slightly lighter, white spotting visible in adults, but instead of forming a cross-band type pattern as seen in specimens of other subspecies, in this taxon are usually sufficiently sparse, to merely appear as scattered tiny spots, these tiny white spots being mainly circular in shape. Iris is a dull brown and tongue is a bluish-grey colour, except at the extremities, where it is whitish at the very outer tips only and light grey at the base. The dark blackish markings on the temples at the back of the head, which range from distinct to semi-distinct in the other subspecies are invariably faded in this subspecies, sometimes making them of the same colour and indistinguishable from the surrounding chocolate brown.

The two postoculars are of unequal size, the bottom one tiny and top one being huge, pushing well into the first temporal shield, making the bottom of the anterior edge angular, making the anterior half of the scale triangular in shape (square edged at the posterior edge).

6/ *C. hotamboeia albalinguacallosus subsp. nov.* is separated from the other subspecies by a dorsum that is purplish brown in colour and a pale tongue that is usually whitish along the entire length, although sometimes with patches of pinkish, purple or blue pigment on the mid-section. White spotting on the dorsum with relatively large, tiny white spots (on average larger than in any other subspecies) remain prominent in adults. Iris is purplish gold and the two postoculars are of similar size.

The species *C. hotamboeia* including all subspecies, are separated from all other species within the genus *Crotaphopeltis* Fitzinger, 1843 and the related genus *Paracrotaphopeltis gen. nov.* by the following suite of characters: 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly. The most similar species morphologically are those four species in the *C. tornieri* (Werner, 1908) complex (being *C. andreeblouinae sp. nov.*, *C. juliusnyererei sp. nov.*, *C. ufipaensis sp. nov.* and *C. rondoensis sp. nov.*), all of which have 17-17-15 dorsal mid body rows and likewise have dorsal scales that are feebly keeled posteriorly (versus smooth in the other species in *Crotaphopeltis*).

*C. hotamboeia* is further separated from the *C. tornieri* complex by having a frontal that is 1.4 to 1.6 times as long as wide, versus 1.1-1.3 in the other species.

*C. hotamboeia* is further defined as follows:

An African savanna living species of *Crotaphopeltis* with the following character combination: body cylindrical; tail short (11-15 percent of total length); 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly; 12-18+II+1 maxillary teeth; 139-181 ventrals; single anal; divided subcaudals, being 31-57 in males and 25-51 in females; hemipenis extending to sub caudal number 7 to 13 and with three distinctly enlarged, stout, proximal spines; dorsum various shades of grey, brown, olive or black, usually with scattered white specks which may tend to form transverse bands in juveniles and subadults; temple usually with a dark, bluish-black or purplish-black mark which may extend backwards to encircle the occiput and reach the last, or the last and penultimate, and rarely also the antepenultimate infralabial; venter and underside of tail white, cream or pale brown, exceptionally with some dark pigmentation; average snout-vent length is 45-65 cm (mainly modified from Rasmussen

*et al.* 2000).

Snakes of the genera *Crotaphopeltis* Fitzinger, 1843 and *Paracrotaphopeltis* *gen. nov.* (the latter until now included in *Crotaphopeltis*) are separated from all other African snake genera (all families) by the following unique suite of characters:

One or more pairs of hollow grooved fangs at the rear of the mouth on the upper jaw; no fangs at the front of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular and not marbled red brown, white or yellow; 141-183 ventrals; body not worm-like; body not vertically flattened in any way, or thick and muscular.

Images of the six subspecies can be found online as follows:

1/ *C. hotamboeia hotamboeia* in life is depicted online at:

<https://www.inaturalist.org/observations/131382831>

and

<https://www.inaturalist.org/observations/157650371>

and

<https://www.inaturalist.org/observations/146067325>

2/ *C. hotamboeia ruziziensis* in life is depicted online at:

<https://www.inaturalist.org/observations/130288>

and

<https://www.inaturalist.org/observations/125957875>

3/ *C. hotamboeia rubrumlabellum subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/67403752>

and

<https://www.inaturalist.org/observations/73598282>

and

<https://www.inaturalist.org/observations/106671151>

4/ *C. hotamboeia luteuslabellum subsp. nov.* in life is depicted online at:

<https://www.flickr.com/photos/cowyeow/5494238278>

and

<https://www.inaturalist.org/observations/468291>

and

<https://www.inaturalist.org/observations/112123534>

5/ *C. hotamboeia labellumpulvereus subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/51220863>

6/ *C. hotamboeia albalinguacallosa subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/71639217>

**Behavioural Notes:** See the previous description of *C. hotamboeia rubrumlabellum subsp. nov.*

**Distribution:** *C. hotamboeia labellumpulvereus subsp. nov.* is found generally west of Kinshasa, Democratic Republic of Congo (DRC) in north-west Angola, including nearby DRC, Congo (Brazzaville) and south west Gabon.

**Etymology:** *C. hotamboeia labellumpulvereus subsp. nov.* is named after the Latin words "*labellum pulvereus*" meaning "peppered lips" in reflection of the peppering on the rear upper labials in adults.

**CROTAPHOPELTIS HOTAMBOEIA ALBALINGUACALLOSO SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:6642F48F-8939-49C2-A9B2-EFBB0B733BCA**

**Holotype:** A preserved specimen at the California Academy of Sciences, San Francisco, California, USA, specimen number CAS HERP 157488 collected from the junction of the Mwachema River and Hwy A14, 2 km north of the Diani Beach turnoff on A14, Ukunda, Kwale District, Coast Province, Kenya, Latitude

-4.25 S., Longitude 39.57 E.

This facility allows access to its holdings.

**Paratype:** A preserved specimen at the California Academy of Sciences, San Francisco, California, USA, specimen number CAS HERP 155888 collected from the Shimba Hills National Reserve Public Camp Site, Kwale District, Coast Province, Kenya, Latitude -4.25 S., Longitude 39.42 E.

**Diagnosis:** Until now, most herpetologists have treated the Herald-Snake, locally known as the Red-lipped Snake in north-east South Africa as a single-wide-ranging taxon found in most parts of sub-Saharan Africa. Engelbrecht *et al.* (2020), found there were six well defined clades of *Crotaphopeltis hotamboeia* (Laurenti, 1768) found in various parts of Africa. They decided that the divergences between each did not warrant species-level division, based on timelines of divergence and potential admixture of populations in zones of contact between clades.

However they also wrote that: "*Intraspecific diversification for C. hotamboeia, however, commenced during the Miocene-Pliocene transition period, ca. 6 Mya (Engelbrecht, 2017)*", which is a time frame of divergence that would normally warrant species-level divisions.

In light of the preceding it is appropriate that each morphologically diagnosable clade is taxonomically recognized as a subspecies within *C. hotamboeia*.

The six subspecies are as follows:

1/ The nominate form of *C. hotamboeia*, herein called *C. hotamboeia hotamboeia* occurs in the far south of South Africa, being found from along the coast from around Cape Town in the West, east to about Durban and north to about Lesotho. This corresponds with Clade 4 in Engelbrecht *et al.* (2020).

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) from the Ruzizi-Kivu basin in Democratic Republic of the Congo corresponds to Clade 3 of Engelbrecht *et al.* (2020) and so is also already named. This is the most widespread subspecies and found in most parts of sub-Saharan Africa, except for the far south (South Africa and the countries that border it) as well as being absent from large parts of east Africa below the horn of Africa.

3/ *C. hotamboeia rubrumlabellum subsp. nov.* occurs from Lesotho and north in South Africa and corresponds with Clade 5 of Engelbrecht *et al.* (2020).

4/ *C. hotamboeia luteuslabellum subsp. nov.* is found around Eswatini, previously known as Swaziland, adjacent parts of north-east South Africa as well as most parts of Mozambique. It corresponds with clade 6 of Engelbrecht *et al.* (2020).

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is found generally west of Kinshasa, Democratic Republic of Congo (DRC) in north-west Angola, including, nearby DRC, Congo (Brazzaville) and south west Gabon. It corresponds with clade 2 of Engelbrecht *et al.* (2020).

6/ *C. hotamboeia albalinguacallosa subsp. nov.* is known only from south-east Kenya. It corresponds with clade 1 of Engelbrecht *et al.* (2020).

The six subspecies are separated from one another by the following unique suites of characters:

1/ *C. hotamboeia hotamboeia* has upper labials that are an immaculate creamy white, almost to the eye, sometimes duller anteriorly. The tongue is dark blue, with the forked tips being white. The dorsum is yellowish-brown to light grey brown. Tiny white spots on the dorsum are mainly rectangular in shape or close to it and not particularly prominent in juveniles. Iris is yellowish to yellowish-grey or beige. One or two postoculars present and if two, both of the same width, First temporal is round edged (half oval) on the upper edge and rectangular on the lower edges.

2/ *C. hotamboeia ruziziensis* (Laurent, 1956) is morphologically similar in most respects to *C. h. hotamboeia* but separated from this and the other subspecies by having a brown iris, pink, or mainly pink tongue including the forked tips, but sometimes

spotted or marked with blue or red on parts, usually (but not always) a greyish tinge or hue on the dorsum, which is otherwise light brown or rarely steel-grey; tiny white spots on the dorsum are mainly oval in shape or similar and they are prominent in juveniles. Upper labials are light brown and sometimes with one or more irregular white bars or spots.

3/ *C. hotamboeia rubrumlabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are distinctive and bold orangeish-red colour that extends virtually to the eye and at the same level up, posterior to it on the sides. The only subspecies likely to be confused with this one is the morphologically similar *C. hotamboeia luteuslabellum subsp. nov.*, which has a slightly less intense orange on the upper labials, but in this case, the area of orange (bright colour) extends upwards to be level with the mid-eye, which is not the case in *C. hotamboeia rubrumlabellum subsp. nov.*

*C. hotamboeia rubrumlabellum subsp. nov.* is further separated from the other five subspecies by the following characters: limited grey peppering on the upper orange-red parts of the upper labials; white spotting on the dorsum is either absent or barely visible in adults, a brownish-red dorsum, first temporal, which is more-or-less rectangular in shape, is twice as long as wide (versus 3 times in *C. hotamboeia luteuslabellum subsp. nov.*), and a mainly blue tongue with white tips. The iris is olive-grey-brown, with orange at the far outer edges.

The two postoculars are of similar width or broadness to one another, although in height the top one is about double that of the lower, making it about double the size.

4/ *C. hotamboeia luteuslabellum subsp. nov.* is readily separated from all other subspecies by the presence of labials that are a distinctive and bold orange colour that extends virtually to the eye and then higher than the eye posterior to it on the sides. This is by way of an expansion in width of the marking, this expansion not being present in the similar looking *C. hotamboeia rubrumlabellum subsp. nov.*

*C. hotamboeia luteuslabellum subsp. nov.* is further separated from the other five subspecies by the following characters: no grey peppering on the upper orange parts of the upper labials; white spotting on the dorsum is usually obvious and prominently visible in most adults, a reddish-grey dorsum, first temporal, which is more-or-less rectangular in shape, is three times as long as wide (versus twice as long as wide in *C. hotamboeia luteuslabellum subsp. nov.* due to the temporal scale being far wider), and a mainly blue tongue with white tips. The iris is dull orange in colour all over.

The two postoculars are of similar width or broadness to one another, although in height the top one and lower one are of about the same size.

5/ *C. hotamboeia labellumpulvereus subsp. nov.* is readily separated from the other species by having whitish upper labials, that are peppered grey-brown (yellowish anteriorly); a dorsum that has a chocolate brown base colour, or slightly lighter, white spotting visible in adults, but instead of forming a cross-band type pattern as seen in specimens of other subspecies, in this taxon are usually sufficiently sparse, to merely appear as scattered tiny spots, these tiny white spots being mainly circular in shape. Iris is a dull brown and tongue is a bluish-grey colour, except at the extremities, where it is whitish at the very outer tips only and light grey at the base. The dark blackish markings on the temples at the back of the head, which range from distinct to semi-distinct in the other subspecies are invariably faded in this subspecies, sometimes making them of the same colour and indistinguishable from the surrounding chocolate brown.

The two postoculars are of unequal size, the bottom one tiny and top one being huge, pushing well into the first temporal shield, making the bottom of the anterior edge angular, making the anterior half of the scale triangular in shape (square edged at the posterior edge).

6/ *C. hotamboeia albalinguacallosa subsp. nov.* is separated

from the other subspecies by a dorsum that is purplish brown in colour and a pale tongue that is usually whitish along the entire length, although sometimes with patches of pinkish, purple or blue pigment on the mid-section. White spotting on the dorsum with relatively large, tiny white spots (on average larger than in any other subspecies) remain prominent in adults. Iris is purplish gold and the two postoculars are of similar size.

The species *C. hotamboeia* including all subspecies, are separated from all other species within the genus *Crotaphopeltis* Fitzinger, 1843 and the related genus *Paracrotaphopeltis gen. nov.* by the following suite of characters: 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly. The most similar species morphologically are those four species in the *C. tornieri* (Werner, 1908) complex (being *C. andreeblouinae sp. nov.*, *C. juliusnyererei sp. nov.*, *C. ufipaensis sp. nov.* and *C. rondoensis sp. nov.*), all of which have 17-17-15 dorsal mid body rows and likewise have dorsal scales that are feebly keeled posteriorly (versus smooth in the other species in *Crotaphopeltis*).

*C. hotamboeia* is further separated from the *C. tornieri* complex by having a frontal that is 1.4 to 1.6 times as long as wide, versus 1.1-1.3 in the other species.

*C. hotamboeia* is further defined as follows:

An African savanna living species of *Crotaphopeltis* with the following character combination: body cylindrical; tail short (11-15 percent of total length); 17-19-15 dorsal scale rows and dorsal scales that are feebly keeled posteriorly; 12-18+II+1 maxillary teeth; 139-181 ventrals; single anal; divided subcaudals, being 31-57 in males and 25-51 in females; hemipenis extending to sub caudal number 7 to 13 and with three distinctly enlarged, stout, proximal spines; dorsum various shades of grey, brown, olive or black, usually with scattered white specks which may tend to form transverse bands in juveniles and subadults; temple usually with a dark, bluish-black or purplish-black mark which may extend backwards to encircle the occiput and reach the last, or the last and penultimate, and rarely also the antepenultimate infralabial; venter and underside of tail white, cream or pale brown, exceptionally with some dark pigmentation; average snout-vent length is 45-65 cm (mainly modified from Rasmussen *et al.* 2000).

Snakes of the genera *Crotaphopeltis* Fitzinger, 1843 and *Paracrotaphopeltis gen. nov.* (the latter until now included in *Crotaphopeltis*) are separated from all other African snake genera (all families) by the following unique suite of characters:

One or more pairs of hollow grooved fangs at the rear of the mouth on the upper jaw; no fangs at the front of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular and not marbled red brown, white or yellow; 141-183 ventrals; body not worm-like; body not vertically flattened in any way, or thick and muscular.

Images of the six subspecies can be found online as follows:

1/ *C. hotamboeia hotamboeia* in life is depicted online at:

<https://www.inaturalist.org/observations/131382831>

and

<https://www.inaturalist.org/observations/157650371>

2/ *C. hotamboeia ruziziensis* in life is depicted online at:

<https://www.inaturalist.org/observations/130288>

and

<https://www.inaturalist.org/observations/125957875>

3/ *C. hotamboeia rubrumlabellum subsp. nov.* in life is depicted online at:

<https://www.inaturalist.org/observations/67403752>

and

<https://www.inaturalist.org/observations/73598282>

and

<https://www.inaturalist.org/observations/106671151>

4/ *C. hotamboeia luteuslabellum* subsp. nov. in life is depicted online at:

<https://www.flickr.com/photos/cowyeow/5494238278>  
and

<https://www.inaturalist.org/observations/468291>  
and

<https://www.inaturalist.org/observations/112123534>

5/ *C. hotamboeia labellumpulvereus* subsp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/51220863>

6/ *C. hotamboeia albalinguacaloso* subsp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/71639217>

**Behavioural Notes:** See the previous description of *C. hotamboeia rubrumlabellum* subsp. nov..

**Distribution:** *C. hotamboeia albalinguacaloso* subsp. nov. is known only from south-east Kenya.

**Etymology:** The subspecies name for *C. hotamboeia albalinguacaloso* subsp. nov. is derived from the Latin words “*alba lingua caloso*” meaning “white tipped tongue”, being a diagnostic feature of this taxon.

#### PARACROTAPHOPELTIS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:C934B463-CA5E-4337-8A29-2DC1885BBE41

**Type species:** *Crotaphopeltis barotseensis* Broadley, 1968.

**Diagnosis:** The monotypic genus *Paracrotaphopeltis* gen. nov. is separated from the morphologically similar genus *Crotaphopeltis* Fitzinger, 1843 by the following unique suite of characters: A relatively narrow head, with a high rostral and no expansion of the temporal region. It is further separated from all species of *Crotaphopeltis* by having the upper postocular separated from the supraocular by a forward prolongation of the parietal, which enters the orbit.

Dorsal scale rows are 17-17-13, versus 17-19-15 rows, 21-19-15 rows or 17-17-15 rows in *Crotaphopeltis* species. Scales dorsally are completely smooth (modified from Broadley, 1968).

Snakes of the genera *Crotaphopeltis* Fitzinger, 1843 and *Paracrotaphopeltis* gen. nov. (the latter until now included in *Crotaphopeltis*) are separated from all other African snake genera (all families) by the following unique suite of characters:

One or more pairs of hollow grooved fangs at the rear of the mouth on the upper jaw; no fangs at the front of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular and not marbled red brown, white or yellow; 141-183 ventrals; body not worm-like; body not vertically flattened in any way, or thick and muscular.

Engelbrecht *et al.* (2021) found the species in the two preceding genera diverged from each other about 10 MYA, warranting genus-level division.

**Distribution:** The only known species as is currently known, is restricted to a relatively small area in Zambia, North Botswana (Okavango Swamp, along Chobe River to upper Zambezi River) and nearby parts of Angola.

**Etymology:** *Paracrotaphopeltis* gen. nov. is named such because the prefix “*para*” means “beside”, or “alongside of”, and this genus sits along side of *Crotaphopeltis* Fitzinger, 1843 as a sister taxon or genus.

**Content:** *Paracrotaphopeltis barotseensis* (Broadley, 1968) (monotypic).

#### CONSERVATION THREATS TO THE NEWLY NAMED TAXA AND RELATIVES

There are no known significant immediate conservation threats to these newly named snake species and subspecies, although the best part of the potential habitat for these taxa have been

effectively erased or otherwise modified by the creation of endless expanses human agriculture of ever increasing intensity throughout the region, brought about by the skyrocketing population of the region (East Africa) where women still as of 2022 have an average of more than 4 children per life time.

Unforeseen threats may include direct human activities (e.g. yet more land clearing for homes or farming activities), as well as potential threats caused by changed vegetation regime. The region is awash with introduced species from the northern hemisphere and Australia, introduced animal pests and potential pathogens, including those introduced via the legal importation of foreign reptiles and amphibians by government-owned zoos and other government backed commercial enterprises.

While there have been localized increases in populations caused by the large amounts of human rubbish and waste creating refuges for snakes (as seen for example, on the outskirts of Cape Town and Johannesburg, South Africa), this is not reason to believe that in the long term any populations are in fact secure and not at risk of decline or extinction.

Denial of the existence of the relevant taxa *sensu* Wüster *et al.* as outlined by Hoser (2019a, 2019b), could ultimately cause extinction of these taxa in the same way it caused one or more earlier extinctions as documented by Hoser (2019a, 2019b), Mitchell (1948) and Peters (1863).

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#### CONFLICTS OF INTEREST

None.