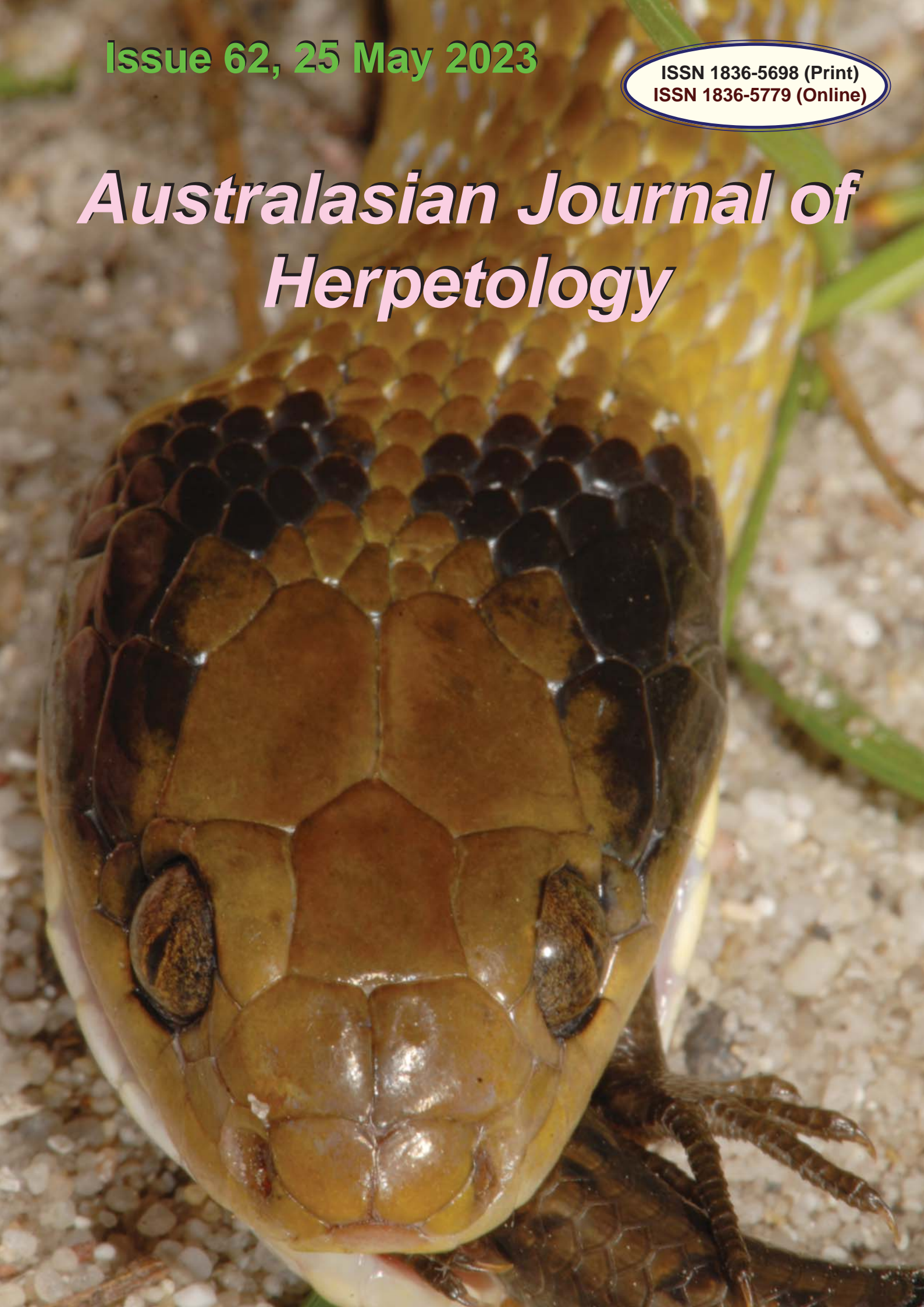


Issue 62, 25 May 2023

ISSN 1836-5698 (Print)
ISSN 1836-5779 (Online)

Australasian Journal of Herpetology



***Australasian Journal of Herpetology*®**

Issue 62, 25 May 2023.

Contents

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

... Raymond T. Hoser, 3-22.

New taxa within the African snake genus *Dipsadoboa* Günther, 1858.

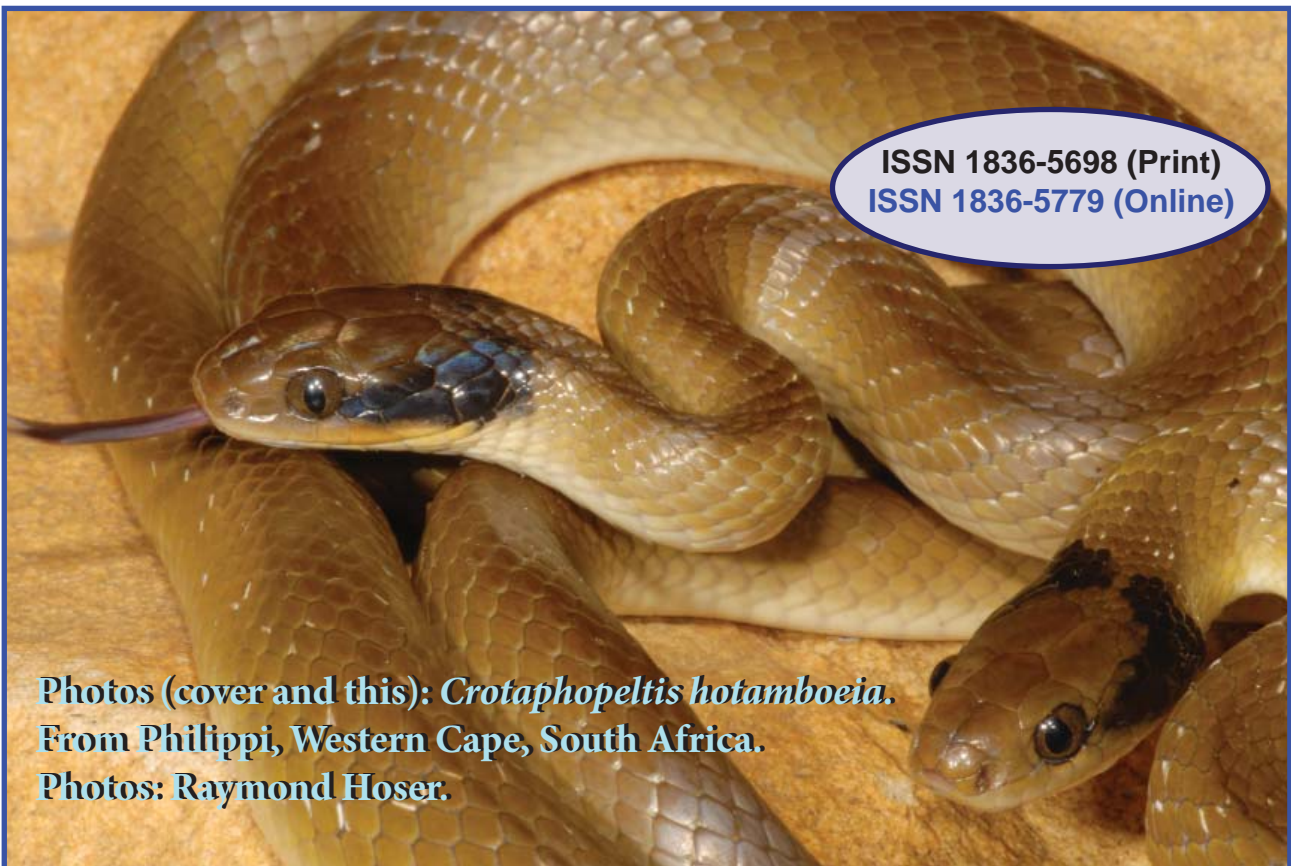
... Raymond T. Hoser, 23-35.

Six new species of viper within *Atheris* Cope, 1862 *sensu lato* from central Africa!

... Raymond T. Hoser, 36-53.

Three new species of Kraits in the *Bungarus fasciatus* (Schneider, 1801) species complex.

... Raymond T. Hoser, 54-64.



ISSN 1836-5698 (Print)
ISSN 1836-5779 (Online)

Photos (cover and this): *Crotaphopeltis hotamboeia*.
From Philippi, Western Cape, South Africa.
Photos: Raymond Hoser.

***Australasian Journal of Herpetology*®**

Publishes original research in printed form in relation to reptiles, other fauna and related matters, including classification, ecology, public interest, legal, captivity, “academic misconduct”, etc. It is a peer reviewed printed journal published in hard copy for permanent public scientific record in accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999 as amended online since), with sizeable print run and global audience and high impact.

Full details at: <http://www.herp.net>

Copyright. All rights reserved.

Online journals (this issue) do not appear for a month after the actual and listed publication date of the printed journals. Minimum print run of first printings is at least fifty hard copies.

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

LSIDURN:LSID:ZOOBANK.ORG:PUB:36D754EC-9FE6-40DE-A1F1-F18AD1A757E5

RAYMOND T. HOSER

LSIDurn:lsid:zoobank.org:author:F9D74EB5-CFB5-49A0-8C7C-9F993B8504AE

488 Park Road, Park Orchards, Victoria, 3134, Australia.

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: snakeman (at) snakeman.com.au

Received 18 June 2022, Accepted 29 April 2023, Published 25 May 2023.

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. hippocrepis* (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*; *hippocrepis*; *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), Segniagbeto *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.

LSIDDurn: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.

LSIDDurn: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.

LSIDDurn: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 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 all other 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 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>

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).

REFERENCES CITED

- Angel, F. 1925. Résultats Scientifiques. Vertébrata. Reptiles et Batraciens. in: *Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911-1912)*. Paris, 2:1-63.
- Angenstein, P. 1996. Zur Haltung und Nachzucht von *Crotaphopeltis hotamboeia* und *C. tornieri* (Serpentes: Boiginae). *Elaphe* 4(3):6-16.
- Auerbach, R. D. 1987. *The Amphibians and Reptiles of Botswana*. Mokwepa Consultants, Botswana: 295 pp.
- Baptista, N. L., António, T. and Branch, W. R. 2019. The herpetofauna of Bicuar National Park and surroundings, southwestern Angola: a preliminary checklist. *Amphibian and Reptile Conservation* 13(2):96-130.
- Barbour, T. and Amaral, A. D. 1927. Studies on African ophidia. *Bulletin of the Antiven Institute of America* 1(1):1-3.
- Barbour, T. and Loveridge, A. 1928. A comparative study of the herpetological fauna of the Uluguru and Usambara mountains, Tanzania Territory with descriptions of new species. *Memoirs of the Museum of Comparative Zoology Cambridge* (Massachusetts), 50(2):85-265.
- Barnett, L. K. 2001. The herpetofauna of Abuko Nature Reserve, the Gambia. *Herpetological Bulletin* (77):5-1.
- Barnett, L. K. and Emms, C. 2005. *Common reptiles of The Gambia*. Rare Repro, Hailsham, East Sussex, UK:24 pp.
- Bates, M. F., Branch, W. R., Bauer, A. M., Burger, M., Marais, J., Alexander, G. J. and de Villiers, M. S. (eds.) 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland. Suricata 1*. South African National Biodiversity Institute, Pretoria, South Africa:512 pp.
- Behangana, M., Magala, R., Katumba, R., Ochanda, D., Kigoolo, S., Mutebi, S., Dendi, D., Luiselli, L. and Hughes, D. F. 2020. Herpetofaunal diversity and community structure in the Murchison Falls-Albert Delta Ramsar site, Uganda: Herpetofaunal diversity. *European Journal of Ecology*, 6(2):1-17.
- Beolens, B., Watkins, M. and Grayson, M. 2011. *The Eponym Dictionary of Reptiles*. Johns Hopkins University Press, Baltimore, USA:xvi+296 pp.
- Bittencourt-Silva, G. B. 2019. Herpetological survey of western Zambia. *Amphibian and Reptile Conservation* 13(2):1-28.
- Bocage, J. V. du B. 1866. Lista dos reptis das possessões portuguesas d'África occidental que existem no Museu Lisboa. *Jornal de sciencias mathematicas, physicas e naturaes Lisboa* 1:37-56.
- Boettger, O. 1893. Übersicht der von Prof. C. Keller anlässlich der Ruspoli'schen Expedition nach den Somaliländern gesammelten Reptilien und Batrachier. *Zoologischer Anzeiger* 16(416):113-119.
- Bogert, C. M. 1940. Herpetological results of the Vernay Angola Expedition. I. Snakes, including an arrangement of the African Colubridae. *Bull. of the American Mus. of Natural History* 77:1-107.

- Böhme, W. and Schneider, B. 1987. Zur Herpetofaunistik Kameruns (3) mit Beschreibung einer neuen *Cardioglossa* (Anura: Arthroleptidae). *Bonner Zoologische Beiträge* 38(3):241-263.
- Böhme, W., Rödel, M., Brede, C. and Wagner, P. 2011. The reptiles (Testudines, Squamata, Crocodylia) of the forested southeast of the Republic Guinea (Guinée forestière), with a country-wide checklist. *Bonn Zoological Bulletin* 60(1):35-61.
- Boulenger, G. A. 1896. *Catalogue of the snakes in the British Museum, Vol. 3*. Taylor and Francis, London, UK:xiv+727 pp.
- Boulenger, G. A. 1897. A list of reptiles and batrachians from the Congo Free State, with the description of two new snakes. *Annals And Magazine of Natural History* (6)19:276-281.
- Boulenger, G. A. 1906. Additions to the herpetology of British East Africa. *Proceedings of the Zoological Society of London* 2:570-573.
- Boycott, R. C. 1992. *An Annotated Checklist of the Amphibians and Reptiles of Swaziland*. The Conservation Trust of Swaziland (online at: <http://eswatininaturereserves.com/checklist/sdreptam.html>).
- Branch, W. R. 1993. *A Photographic Guide to Snakes and Other Reptiles of Southern Africa*. Struik Publishers, Cape Town, South Africa:144 S.
- Branch, W. R. 2005. *Crotaphopeltis hotamboeia* (Laurenti, 1768) Herald Snake - Maximum size. *African Herp News* (38):25.
- Branch, W. R., Rödel, M. -O. and Marais, J. 2005. Herpetological survey of the Niassa Game Reserve, northern Mozambique - Part I: Reptiles. *Salamandra* 41(4):195-214.
- Branch, W. R., Pinto, P. V., Baptista, N. and Conradie, W. 2019. The Reptiles of Angola: History, Diversity, Endemism and Hotspots. Chapter 13, being pp. 283-334 in: B. J. Huntley *et al.* (eds.), *Biodiversity of Angola*. Springer Verlag, Germany:549 pp.
- Broadley, D. G. 1959. The herpetology of Southern Rhodesia. Part I: The snakes. *Bull. of the Mus. of Comp. Zool. Harvard* 120(1):1-100.
- Broadley, D. G. 1962. On some reptile collections from the North-Western and North-Eastern Districts of Southern Rhodesia 1958-1961, with descriptions of four new lizards. *Occasional Papers of the National Museums of Southern Rhodesia* 26(B):787-843.
- Broadley, D. G. 1968. A new species of *Crotaphopeltis* (Serpentes: Colubridae) from Barotseland, Zambia. *Fieldiana Zoology* 51(10):135-139.
- Broadley, D. G. 1991. The Herpetofauna of Northern Mwinilunga District, Northwest Zambia. *Arnoldia Zimbabwe* 9(37):519-538.
- Broadley, D. and Blaylock, R. 2013. *The Snakes of Zimbabwe and Botswana*. Chimaira, Frankfurt, Germany:387 pp.
- Broadley, D. G. and Cotterill, F. P. D. 2004. The reptiles of southeast Katanga, an overlooked 'hot spot'. *African J. of Herp.* 53(1):35-61.
- Broadley, D. G. and Howell, K. M. 1991. A check list of the reptiles of Tanzania, with synoptic keys. *Syntarsus* 1:1-70.
- Broadley, D. G., Doria, C. T. and Wigge, J. 2003. *Snakes of Zambia. An Atlas and Field Guide*. Edition Chimaira, Frankfurt, Germany:280 pp.
- Burger, M., Branch, W. R. and Channing, A. 2004. Amphibians and Reptiles of Monts Doudou, Gabon: Species turnover along an elevational gradient. *California Acad. of Sciences Mem.* 28:145-186.
- Calabresi, E. 1925. Anfibi e rettili raccolti dal Signor Ugo Ignesti nell'Abissinia settentrionale. *Atti della Società Italiana di Scienze Naturali, e del Museo Civico di Storia Naturale, Milano* 64:100-109.
- Ceraico, L. M. P., Aesch, E., Ahyong, S. T., Ballerio, A., Bouchard, P., Bourgoin, T., Dmitriev, D., Evenhous, N., Grygier, M. J., Harvey, M. S., Kottelat, M., Kluge, N., Krell, F. T., Kojima, J., Kullander, S. O., Lucinda, P., Lyal, C. H. C., Pyle, R. L., Rheindt, F. E., Scioscia, C. L., Welter-Schultes, F., Whitmore, D., Yanega, D., Zhang, Z. Q., Zhou, H. Z., Pape, T. (being the unanimous voice of the entire ICZN) 2023. Renaming taxa on ethical grounds threatens nomenclatural stability and scientific communication. *Zoological Journal of the Linnean Society*, 197, 283-286.
- Chifundera, K. 1990. Snakes of Zaire and their bites. *African study monographs* (Kyoto:Japan) 10(3):137-157.
- Chippaux, J. and Jackson, K. 2019. *Snakes of Central and Western Africa*. Johns Hopkins University Press, USA:448 pp.
- Chirio, L. 2009. Inventaire des reptiles de la région de la Réserve de Biosphère Transfrontalière du W (Niger/Bénin/Burkina Faso: Afrique de l'Ouest). *Bull. Société herpétologique de France* (132):13-41.
- Chirio, L. and Lebreton, M. 2007. *Atlas des reptiles du Cameroun*. MNHN, IRD, Paris, France:688 pp.
- Chirio, L. and Ineich, I. 2006. Biogeography of the reptiles of the Central African Republic. *African Journal of Herpetology* 55(1):23-59.
- Cogger, H. G. 2014. *Reptiles and Amphibians of Australia* (Seventh edition), CSIRO. Sydney, Australia:1064 pp.
- Conradie, W. and Branch, W. R. 2016. The herpetofauna of the Cubango, Cuito, and lower Cuando river catchments of south-eastern Angola. *Amphibian and Reptile Conservation* 10(2):6-36.
- Conradie, W., Reeves, B., Brown, N. and Venter, J. A. 2016. Herpetofauna of the Oviston, Commando Drift and Tsolwana nature reserves in the arid interior of the Eastern Cape Province, South Africa. *Indago* 32:81-98.
- Conradie, W., Reeves, B., Mdoko, S., Pamla, L. and Gxabhu, O. 2020. Herpetological survey of the Ongeluksnek (Malekgalonyane) Nature Reserve on the foothills of the Drakensberg, Eastern Cape Province, South Africa. *Herpetology Notes* 13:717-730.
- Conradie, W., Baptista, N. D., Verburg, L., Keates, C., Harvey, J., Julio, T. and Neef, G. 2021. Contributions to the herpetofauna of the Angolan Okavango-Cuando-Zambezi river drainages. Part 1: Serpentes (snakes). *Amphibian and Reptile Conservation* 15(2):244-278.
- Cope, E. D. 1862. Notes upon some reptiles of the Old World. *Proceedings of the Academy of Natural Sciences of Philadelphia* 14:337-344.
- Cotton, T. 2014. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see BZN 70: 234-237, 71: 30-38; 133-135). *Bulletin of Zoological Nomenclature* 71(3):181-182.
- Dubois, A., Bauer, A. M., Ceriaco, L. M. P., Dusouler, F., Fretey, T., Lobl, I., Lorvelec, O., Ohler, A., Stopiglia, R. and Aesch, E. 2019. The Linz Zoocode project: a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. First report of activities (2014-2019). *Bionomina* 17:1-111.
- Duméril, A. M. C., Bibron, G. and Duméril, A. H. A., 1854. *Erpétologie générale ou histoire naturelle complète des reptiles. Tome septième. Deuxième partie, comprenant l'histoire des serpents venimeux*. Librairie Encyclopédique de Roret, Paris, France:i-xii+781-1536.
- Eniang, E. A., Akani, G. C., Rugiero, L., Vignoli, L. and Luiselli, L. 2013. Ecological data of Nigerian *Crotaphopeltis hotamboeia* (Colubridae) populations. *The Herpetological Journal* 23(1):5-9.
- Engelbrecht, H. M. 2017. The radiation and biogeography of snakes across south-eastern Africa with respect to the evolution of the savanna biome. PhD thesis, Stellenbosch University, South Africa.
- Engelbrecht, H. M., Branch, W. R., Greenbaum, E., Burger, M., Conradie, W. and Tolley, K. A. 2020. African Herald snakes, *Crotaphopeltis*, show population structure for a widespread generalist but deep genetic divergence for forest specialists. *Journal of Zoological Systematics and Evolutionary Research* 2020;00:1-14 (Online).
- Engelbrecht, H. M., Branch, W. R. and Tolley, K. A. 2021. Snakes on an African plain: the radiation of *Crotaphopeltis* and *Philothamnus* into open habitat (Serpentes: Colubridae). *PeerJ* 9:e11728 (PRINO) (Online):18 pp.
- Ernst, R., Lautenschläger, T., Branquima, M. F. and Hölting, M. 2020. At the edge of extinction: a first herpetological assessment of the proposed Serra do Pingano Rainforest National Park in Uíge Province, northern Angola. *Zoosystematics and Evolution* 96(1):237-262.
- Finke, F. and Liepack, D. 2021. Erstnachweis der Torniers Katzennatter *Crotaphopeltis tornieri* (Werner, 1908) in Kenia. *Sauria* 43(2):67-70.
- Fitzinger, L. 1843. *Systema Reptilium. Fasciculus primus: Amblyglossae*. Vindobonae: Braumüller und Seidel, Germany:106 pp.
- Fraser, M. 2023. Reptiles and Amphibians of the Cape of Good Hope Nature Reserve, Western Cape, South Africa. *Biodiversity Observations* 13:162-185.
- Gans, C., Laurent, R. F. and Pandit, H. 1965. Notes on a herpetological collection from the Somali Republic. *Ann. Mus. Roy. Afr. Centr., Sér. 8vo, Tervuren*, (80) Zool. (134):1-93.
- Gemel, R., Gassner, G. and Schweiger, S. 2019. Katalog der Typen

- der Herpetologischen Sammlung des Naturhistorischen Museums Wien - 2018. *Annalen des Naturhistorischen Museums in Wien B* 121:33-248.
- Gray, J. E. 1858. Description of a new genus of Boidae from Old Calabar and a list of West African Reptiles. *Proceedings of the Zoological Society of London* 1858:154-167.
- Günther, A. 1895. Notice of Reptiles and Batrachians collected in the eastern half of tropical Africa. *Annals And Magazine of Natural History* (6)15:523-529.
- Haagner, G. V. and Branch, W. R. 1995. Life History Notes - *Crotaphopeltis hotamboeia*. *African Herp News* (23):44-44.
- Haagner, G. V., Branch, W. R. and Haagner, A. J. F. 2000. Notes on a collection of reptiles from Zambia and adjacent areas of the Democratic Republic of the Congo. *Annals of the Eastern Cape Museum* 1:1-25.
- Hallermann, J. 1998. Annotated catalogue of the type specimens of the herpetological collection in the Zoological Museum of the University of Hamburg. *Mitteilungen aus dem Hamburgischen Zoologischen Museum Inst* 95:197-223.
- Hammer, T. A. and Thiele, K. R. 2021. Proposals to amend Articles 51 and 56 and Division III, to allow the rejection of culturally offensive and inappropriate names. *Taxon* 70(6):1392-1394.
- Hawkeswood, T. J. 2021. Time to end taxonomic vandalism by Wolfgang Wuster *et al.*: The Snakeman, Raymond Hoser's publications are validly published and his names available according to the ICZN: Objective investigation finds Hoser's taxonomic works as scientific best practice and in every relevant case identifies valid entities. *Calodema* 860:1-59.
- Hellmich, W. 1957. Herpetologische Ergebnisse einer Forschungsreise in Angola. *Veröff. Zool. Staatssammlung München* 5:1-91.
- Herrmann, H. -W. and Branch, W. R. 2013. Fifty years of herpetological research in the Namib Desert and Namibia with an updated and annotated species checklist. *Journal of Arid Environments* 93:94-115.
- Honess, P. E. and Bearder, S. K. 1997. Descriptions of the dwarf galago species of Tanzania. *African Primates* 2:75-79.
- Hoser, R. T. 2007a. Wells and Wellington - It's time to bury the hatchet. *Calodema* Supplementary Paper 1:1-9.
- Hoser, R. T. 2017b. Call to outlaw the use of Tongs for catching and handling deadly snakes. *Bulletin of the Chicago Herpetological Society* 42(6):92-95.
- Hoser, R. T. 2009. Creationism and contrived science: A review of recent python systematics papers and the resolution of issues of taxonomy and nomenclature. *Australasian Journal of Herpetology* 2:1-34. (3 February).
- Hoser, R. T. 2012a. Exposing a fraud! *Afronaja* Wallach, Wüster and Broadley 2009, is a junior synonym of *Spracklandus* Hoser 2009! *Australasian Journal of Herpetology* 9 (3 April 2012):1-64.
- Hoser, R. T. 2012b. Robust taxonomy and nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.
- Hoser, R. T. 2013. The science of herpetology is built on evidence, ethics, quality publications and strict compliance with the rules of nomenclature. *Australasian Journal of Herpetology* 18:2-79.
- Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.
- Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.
- Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-64.
- Hoser, R. T. 2015d. PRINO (Peer reviewed in name only) journals: When quality control in scientific publications fails. *Australasian Journal of Herpetology* 26:3-64.
- Hoser, R. T. 2015e. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.
- Hoser, R. T. 2015f. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). *Australasian Journal of Herpetology* 27:37-54.
- Hoser, R. T. 2019a. 11 new species, 4 new subspecies and a subgenus of Australian Dragon Lizard in the genus *Tympanocryptis* Peters, 1863, with a warning on the conservation status and long-term survival prospects of some newly named taxa. *Australasian Journal of Herpetology* 39:23-52.
- Hoser, R. T. 2019b. Richard Shine *et al.* (1987), Hinrich Kaiser *et al.* (2013), Jane Melville *et al.* (2018 and 2019): Australian Agamids and how rule breakers, liars, thieves, taxonomic vandals and law breaking copyright infringers are causing reptile species to become extinct. *Australasian Journal of Herpetology* 39:53-63.
- Hughes, B. 2013. Snakes of Bénin, West Africa. *Bull. Société herpétologique de France* 144:101-159.
- Hughes, B. 2018. The Snakes of Dodoma. *African Herp News* (67):8.
- International Commission of Zoological Nomenclature (ICZN) 1991. Decision of the commission. Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 48(4):337-338.
- International Commission of Zoological Nomenclature (ICZN) 2001. Opinion 1970. *Bulletin of Zoological Nomenclature* 58(1):74. (30 March 2001).
- International Commission of Zoological Nomenclature (ICZN) 2012. Amendment of Articles 8, 9, 10, 21 and 78 of the *International Code of Zoological Nomenclature* to expand and refine methods of publication. *Zootaxa* (PRINO) (Online) 3450:1-7.
- International Commission of Zoological Nomenclature (ICZN) 2021. Opinion 2468 (Case 3601) - *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and *Australasian Journal of Herpetology* issues 1-24: confirmation of availability declined; Appendix A (Code of Ethics): not adopted as a formal criterion for ruling on Cases. *Bulletin of Zoological Nomenclature* 78 (30 April 2021):42-45.
- Jackson, K., Zassi-Boulou, A., Mavoungou, L. and Pangou, S. 2007. Amphibians and Reptiles of the LacTélé Community Reserve, Likouala Region, Republic of Congo (Brazzaville). *Herp. Cons. Biol.* (2):75-86.
- Jacobsen, N. H. G. 2009. A contribution to the herpetofauna of the Passendro Area, Central African Republic. *African Herp News* (47):2-20.
- Jacobsen, N. H. G., Pietersen, E. W. and Pietersen, D. W. 2010. A preliminary herpetological survey of the Vilanculos Coastal Wildlife Sanctuary on the San Sebastian Peninsula, Vilankulo, Mozambique. *Herpetology Notes* 3:181-193.
- Joger, U. 1982. Zur Herpetofaunistik Kameruns (II). *Bonner Zoologische Beiträge* 33(2-4):313-319.
- Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.
- Kaiser, H. 2012b. Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.
- Kaiser, H. 2013. The Taxon Filter, a novel mechanism designed to facilitate the relationship between taxonomy and nomenclature, vis-à-vis the utility of the Code's Article 81 (the Commission's plenary power). *Bulletin of Zoological Nomenclature* 70(4) December 2013:293-302.
- Kaiser, H. 2014a. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature*, 71(1):30-35.

- Kaiser, H. 2014b. Best Practices in Herpetological Taxonomy: Errata and Addenda. *Herpetological Review*, 45(2):257-268.
- Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.
- Keogh, J. S., Branch, W. R. and Shine, R. 2000. Feeding ecology, reproduction and sexual dimorphism in the colubrid snake *Crotaphopeltis hotamboeia* in southern Africa. *African Journal of Herpetology* 49:129-137.
- Lanza, B. 1990. Amphibians and reptiles of the Somali Democratic Republic: check list and biogeography. *Biogeographia* 14:407-465.
- Largen, M. J. and Rasmussen, J. B. 1993. Catalogue of the snakes of Ethiopia (Reptilia Serpentes), including identification keys. *Tropical Zoology* 6:313-434.
- Largen, M. J. and Spawls, S. 2010. *Amphibians and Reptiles of Ethiopia and Eritrea*. Edition Chimaira, Frankfurt, Germany:694 pp.
- Laurenti, J. N. 1768. *Specimen medicum, exhibens synopsis reptilium emendatam cum experimentis circa venena et antidota reptilium austracorum, quod auctoritate et consensu*. Vienna, Joan Thomae:217 pp.
- Leaché, A. D., Rödel, M., Linkem, C. W., Diaz, R. E., Hillers, A. and Fujita, M. K. 2006. Biodiversity in a forest island: reptiles and amphibians of the Togo Hills, Kyabobo National Park, Ghana. *Amphibian and Reptile Conservation* 4(1):22-45.
- Lillywhite, H. B. 2014. *How Snakes Work: Structure, Function and Behavior of the World's Snakes*. Oxford Uni. Press, NY, USA:256 pp.
- Loveridge, A. 1929. East African reptiles and amphibians in the United States National Museum. *Bulletin US Nat. Mus.* (151):1-135.
- Loveridge, A. 1936. African reptiles and amphibians in the Field Museum of Natural History. *Zoological series Field Museum of Natural History Chicago*, 22(1):1-122.
- Loveridge, A. 1938a. On a collection of reptiles and amphibians from Liberia. *Proceedings of the New England Zoological Club* 17:49-74.
- Loveridge, A. 1938b. Zoological results of the George Vanderbilt African expedition of 1934. VII. Reptiles and amphibians. *Proc. of the Acad. of Nat. Sciences of Philadelphia* 89 [1937]:265-296.
- Loveridge, A. 1956. On snakes collected in the Anglo-Egyptian Sudan by J.S. Owen, Esq. *Sudan Notes and Records* 36 [1955]:37-56.
- Lyakurwa, J. V. 2017. The Reptiles of the Uzungwa Scarp Forest Reserve (USFR): An Updated Checklist with Notes on Dagger-Tooth Vine Snake *Xyelodontophis uluguruensis*. *Journal of East African Natural History* 106(2):57-65.
- Lyakurwa, J. V., Howell, K. M., Munishi, L. K. and Treydte, A. C. 2019. Uzungwa Scarp Nature Forest Reserve; a unique hotspot for reptiles in Tanzania. *Acta Herpetologica* 14(1):3-14.
- Malonza, P. K., Mulwa, D. M., Nyamache, J. O. and Jones, G. 2017. Biogeography of the Shimba Hills ecosystem herpetofauna in Kenya. *Zoological Research* 38(5):1-11.
- Malonza, P. K., Wasonga, V. D., Muchai, V., Rotich, D., Bwong, B. A. and Bauer, A. M. 2006. Diversity and biogeography of herpetofauna of the Tana River Primate National Reserve, Kenya. *Journal of East African Natural History* 95(2):95-109.
- Masters, J. C., Fabien G. S., Couette, C. P., Groves, S. D., Nash, M. D. and Pozzi, L. 2017. A new genus for the eastern dwarf galagos (Primates: Galagidae). *Zoological Journal of the Linnean Society*, 181:229-241.
- Mehrtens, J. M. 1987. *Living snakes of the world in color*. Sterling Publishing Co., New York, NY, USA:480 pp.
- Menegon, M., Loader, S. P., Marsden, S. J., Branch, W. R., Davenport, T. R. B. and Ursenbacher, S. 2014. The genus *Atheris* (Serpentes: Viperidae) in East Africa: Phylogeny and the role of rifting and climate in shaping the current pattern of species diversity. *Molecular Phylogenetics and Evolution* 79:12-22.
- Menzies, J. I. 1966. The snakes of Sierra Leone. *Copeia* 1966(2):169-179.
- Mitchell, F. J. 1948. A revision of the lacertilian genus *Tympanocryptis*. *Records of the South Australian Museum* 9:57-86.
- Monard, A. 1931. Mission scientifique Suisse dans l'Angola. Résultats scientifiques. Reptiles. *Bulletin de la Société des sciences naturelles de Neuchâtel* 33:89-111.
- Monard, A. 1940. Résultats de la mission du Dr. Monard en Guinée Portugaise 1937-1938. *Arquivos do Museu Bocage* Lisbon 11:147-182.
- Mosyakin, S. L. 2022. If "Rhodes-" must fall, who shall fall next? *Taxon* 71:49-255.
- Nicolay, H. 1989. Beobachtungen an *Crotaphopeltis hotamboeia* (Laurenti, 1768). *Herpetofauna* (Germany) 11(61):19-21.
- Pauwels, O. S. G. and Vande Weghe, J. P. 2008. *Les reptiles du Gabon*. Smithsonian Institution, Washington:272 pp.
- Pauwels, O. S. G., Christy, P. and Honorez, A. 2006. Reptiles and National Parks in Gabon, Western Central Africa. *Hamadryad* 30(1-2):181-196.
- Pauwels, O. S. G., Le Garff, G. B., Ineich, I., Carlino, P., Melcore, I., Boundenga, L., Vigna, C., Stévant, T., Jeffery, K., Orbell, C., Squarcini, J. -B., Vande weghe, J. P. and White, L. J. T. 2016. Miscellanea Herpetologica Gabonica V and VI. *Bulletin of the Chicago Herpetological Society* 51:177.
- Pauwels, O. S. G., Morelle, S., Albert, J. -L., Carlino, P., Rahola, N. and Trape, J. -F. 2019. New reptile records from Lékédi Park and Haut-Ogooué Province, southeastern Gabon. *Amphibian and Reptile Conservation* 13(1):143-161.
- Pauwels, O. S. G., Chirio, L. and Dekoninck, W. 2022. Diet records for snakes from Guinea, West Africa. *Bulletin of the Chicago Herpetological Society* 57(6): 117-123.
- Peracca, M. G. 1897. Intorno ad alcuni Ofidii raccolti a Maldì (Eritrea) dal Capitano A. Gasca. *Bollettino dei Musei di Zoologia e di Anatomia Comparata della R. Università di Torino* 12(273):1-3.
- Peters, W. C. H. 1863. Eine Übersicht der von Hrn. Richard Schomburgk an das zoologische Museum eingesandten Amphibien, aus Buchsfelde bei Adelaide in Südastralien. *Monatsberichte der Königlich-Preussische Akademie der Wissenschaften zu Berlin* 1863 (April):228-236.
- Pietersen, D., Verburt, L. and Davies, J. 2021. *Snakes and other reptiles of Zambia and Malawi*. Struik Nature / Penguin / Random House, South Africa:376 pp.
- Pitman, C. R. S. 1974. *A guide to the snakes of Uganda*. Codicote, Wheldon and Wesley, L., UK:290 pp.
- Pyron, R. A., Burbrink, F. T. and Weins, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evol. Biol.* 13, 93. Published online at: <http://www.biomedcentral.com/1471-2148/13/93>.
- Rasmussen, J. B. 1981. The snakes from the rainforest of the Usambara Mountains, Tanzania: a checklist and key. *Salamandra* 17(3-4):173-188.
- Rasmussen, J. B. 1985. A new species of *Crotaphopeltis* from east Africa, with remarks on the identity of *Dipsas hippocrepis* Reinhardt, 1843 (Serpentes: Boiginae). *Steenstrupia* 11(4):113-129.
- Rasmussen, J. B. 1993. The current taxonomic status of Tornier's cat-snake (*Crotaphopeltis tornieri*). *Amphibia-Reptilia* 14:395-409.
- Rasmussen, J. B. 1997. On two little-known African water snakes (*Crotaphopeltis degeni* and *Crotaphopeltis barotseensis*). *Amphibia-Reptilia* 18:191-206.
- Rasmussen, J. B. and Hughes, B. 1996. Description of some new snake species. I. (English translation of the original Danish text of T. Reinhardt 1843). *Steenstrupia* 22:13-39.
- Rasmussen, J. B., Chirio, L. and Ineich, I. 2000. The Herald Snakes (*Crotaphopeltis*) of the Central African Republic, Including a Systematic Review of *C. hippocrepis*. *Zoosystema* 22(3):585-600.
- Razzetti, E. and Msuya, C. A. 2002. *Field guide to the amphibians and reptiles of Arusha National Park (Tanzania)*. Publ. Ed. Negri Istituto, Oikos, Varese:84 pp.
- Reinhardt, J. T. 1843. Beskrivelse af nogle nye Slangearter. *Danske Vidensk. Selsk. Afhandl.* 10:233-279.
- Rhodin, A. et al. (70 listed authors, with some later publishing that they had never read the document they allegedly co-authored) 2015. Comment on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes,

- Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; 71: 30-38, 133-135, 181-182, 252-253). *Bull. of Zool. Nomenclature* 72(1):65-78.
- Ride, W. D. L. (ed.) et al. (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature*. The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").
- Robertson, I. A. D., Chapman, B. M. and Chapman, N. F. 1963. Notes on some reptiles collected in the Rukwa Valley, S. W. Tanganyika. *Annals And Magazine of Natural History* Ser. 13, 5(55):421-432.
- Rödel, M. O. and Mahsberg, D. 2000. Vorläufige Liste der Schlangen des Tai-Nationalparks/Elfenbeinküste und angrenzender Gebiete. *Salamandra* 36(1):25-38.
- Rödel, M. O., Kouadio, K. and Mahsberg, D. 1999. Die Schlangenfauna des Comoé-Nationalparks, Elfenbeinküste: Ergänzungen und Ausblick. *Salamandra* 35(3):165-180.
- Roman, B. 1974. Deux espèces du genre *Crotaphopeltis* (Colubridés Ophistoglyphes) dans le territoire de Haute-Volta: *Crotaphopeltis hotamboeia* (Laurent) et *Crotaphopeltis acarina* n. sp. *Notes et documents Voltaïques* 8(1):13 pp.
- Rovero, F., Menegon, M., Fjeldså, J., Collett, L., Doggart, N., Leonard, C., Norton, G., Owen, N., Perkin, A., Spitale, D., Ahrends, A. and Burgess, N. D. 2014. Targeted vertebrate surveys enhance the faunal importance and improve explanatory models within the Eastern Arc Mountains of Kenya and Tanzania. *Diversity and Distributions* 20(12):1438-1449.
- Sapwell, J. 1969. An Unusual Defensive Display by a West African Snake, *Crotaphopeltis hotamboeia hotamboeia* (Laurenti). *Herpetologica* 25(4):314-315.
- Schmidt, K. P. 1923. Contributions to the herpetology of the Belgian Congo based on the collection of the American Museum Congo Expedition, 1909-1915. Part II. Snakes, with field notes by Herbert Lang and James P. Chapin. *Bulletin of the American Museum of Natural History* 49(1):1-146.
- Scortecchi, G. 1929. Primo contributo alla conoscenza dei Rettili e degli Anfibi della Somalia italiana. *Atti Soc. ital. Sci. nat.* 68:245-279.
- Scortecchi, G. 1931. Contributo alla conoscenza dei rettili e degli anfibi della Somalia, dell'Eritrea e dell'Abissinia. *Boll. Mus. Zool. Univ. Torino*, (ser. 3) 41(10) [1930]:1-26.
- Seba, A. 1734. *Locupletissimi Rerum naturalium Thesauri accurata Descriptio, et Iconibus artificiosissimus Expressio, per universam Physices Historiam. Opus, cui in hoc Rerum Genere, nullum par existit. Vol. 1.* Janssonio-Waesbergios, Amsterdam, The Netherlands:178 pp.
- Segniagbeto, G., Lazcano, H., Trape, J. F., David, P., Ohler, A., Dubois, A. and Glieth I. A. 2011. The snake fauna of Togo: systematics, distribution and biogeography, with remarks on selected taxonomic problems. *Zoosystema* 33(3):325-360.
- Segniagbeto, G. H., Dekawole, J. K., Ketoh, G. K., Dendi, D. and Luiselli, L. 2022. Herpetofaunal Diversity in a Dahomey Gap Savannah of Togo (West Africa): Effects of Seasons on the Populations of Amphibians and Reptiles. *Diversity* 14:964:15 pp.
- Senter, P. J. and Chippaux, J. P. 2022. Biogeography of snakes in Liberia: Review and synthesis of current knowledge. *Ghana Journal of Science* 63(1):29-62.
- Smith, A. 1849. *Illustrations of the Zoology of South Africa. 3 (Reptiles)*. Smith, Elder, and Co., London, UK.
- Spawls, S., Howell, K., Hinkel, H. and Menegon, M. 2011. *Field Guide to East African Reptiles*. Bloomsbury, UK:543 pp.
- Spawls, S., Howell, K., Hinkel, H. and Menegon, M. 2018. *Field Guide to East African Reptiles*. Bloomsbury, UK:624 pp.
- Sternfeld, R. 1917. Reptilia und Amphibia. in: Schubotz, H. (Hrsg.): *Wissenschaftliche Ergebnisse der Zweiten Deutschen Zentral-Afrika-Expedition, 1910-1911 unter Führung Adolph Friedrichs, Herzog zu Mecklenburg*. Leipzig: Klinkhardt und Biermann, [Band] 1, *Zoologie, Lieferung* 11:407-510.
- Thiele, K. R., Oliver, P. M., Bauer, A. M., Doughty, P., Kraus, F., Rix, M. G. and Kaiser, H. 2020. Case 3824 - A special proposal to suppress certain names under the plenary powers of the Commission. *Bulletin of Zoological Nomenclature* 77:78 (title only). The full submission to the ICZN was sent out as a SPAM email to thousands of recipients. It is a rambling 71 page pdf and is widely available online.
- Tolley, K. A., Telford, N. S., Makhubo, B. G., Power, R. J. and Alexander, G. J. 2023. Filling the gap: Noteworthy herpetological discoveries in North West Province, South Africa. *Zoosystematics and Evolution* 99(1):101-116.
- Trape, J. -F. and Balde, C. 2014. A checklist of the snake fauna of Guinea, with taxonomic changes in the genera *Philothamnus* and *Dipsadoboa* (Colubridae) and a comparison with the snake fauna of some other West African countries. *Zootaxa* (PRINO) (Online) 3900(3):301-338.
- Trape, J. -F. and Collet, M. 2021. Nouvelles données sur les serpents du sud-est du Katanga. *Bull. Société herpétologique de France* 179:11-26.
- Trape, J. -F. and Mané, Y. 2000. Les serpents des environs de Dielmo (Sine-Saloum, Sénégal). *Bull. Société herp. France* 95:19-35.
- Trape, J. -F. and Mané, Y. 2004. Les serpents des environs de Bandafassi (Sénégal oriental). *Bull. Société herp. France* 109:5-34.
- Trape, J. -F. and Mané, Y. 2006. *Guide des serpents d'Afrique occidentale. Savane et désert.* [Senegal, Gambia, Mauritania, Mali, Burkina Faso, Niger]. IRD Editions, Paris, France:226 pp.
- Trape, J. -F. and Mané, Y. 2015. The snakes of Niger. *Amphibian and Reptile Conservation* 9(2):39-55 (e110) (online).
- Trape, J. -F. and Mané, Y. 2017. The snakes of Mali. *Bonn Zoological Bulletin* 66(2):107-133.
- Trape, J. -F. and Roux-Esteve, R. 1995. Les serpents du Congo: liste commentée et clé de détermination. *Journal of African Zoology* 109(1):31-50.
- Trape, J. -F., Kodindo, I. D., Djiddi, A. S., Mad-Toingué, J. and Kerah, C. H. 2020. The snakes of Chad: results of a field survey and annotated country-wide checklist. *Bonn Zool. Bulletin* 69(2):367-393.
- Ullrich, K., Grell, O. and Böhme, W. 2010. Reptiles from southern Benin, West Africa, with the description of a new *Hemidactylus* (Gekkonidae), and a country-wide checklist. *Bonn Zool. Bull.* 57(1):31-54.
- Venter, J. A. and Conradie, W. 2015. A checklist of the reptiles and amphibians found in protected areas along the South African Wild Coast, with notes on conservation implications. *Koedoe* 57(1):1-25.
- Wallach, V., Williams, K. L. and Boundy, J. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. Taylor and Francis, CRC Press, USA/UK:1237 pp.
- Wellington, R. W. 2015. Comment on the proposed confirmation of the availability of the generic name *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature* 72(3):222-226.
- Werner, F. 1899. Ueber Reptilien und Batrachier aus Togoland, Kamerun und Deutsch-Neu-Guinea grösstentheils aus dem k. Museum für Naturkunde in Berlin. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* 49:132-157.
- Werner, F. 1908. Ergebnisse der mit Subvention aus der Erbschaft Treilt unternommenen zoologischen Forschungsreise Dr. Franz Werner's nach nach dem Ägyptischen Sudan und Norduganda. XII. die Reptilien und Amphibien. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften Wien* 116 [1907]:1823-1926.
- Zassi-Boulou, A. G., Tchimbakala, J. G., Mavoungou, L. B. and Jackson, K. 2020. A Survey of Snakes in the Patte d'Oie Forest Reserve (Brazzaville, Republic of Congo): an Urban Snake Community in Central Africa. *Herpetological Conservation and Biology*, 15(1):139-149.

CONFLICTS OF INTEREST

None.

New taxa within the African snake genus *Dipsadoboa* Günther, 1858.

LSIDURN:LSID:ZOOBANK.ORG:PUB:3EBC575C-59D8-459F-9A22-195250E891BD

RAYMOND T. HOSER

LSIDurn:lsid:zoobank.org:author:F9D74EB5-CFB5-49A0-8C7C-9F993B8504AE

488 Park Road, Park Orchards, Victoria, 3134, Australia.

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: snakeman (at) snakeman.com.au

Received 11 January 2023, Accepted 28 April 2023, Published 25 May 2023.

ABSTRACT

Following extensive fieldwork by Raymond Hoser in Africa in 2009, the snakes of the pan-African genus *Dipsadoboa* Günther, 1858 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.

That there were unnamed species within this genus, at least within the East African arc of so-called “sky islands” or constrained by them in intervening zones, was also common knowledge within herpetology (Branch *et al.* 2019).

The urgency of the need to identify and formally describe these forms to enable proper management and conservation plans has been underlined by the rampant ongoing human population growth in the region. The relevant countries of East Africa (Ethiopia, south to Mozambique) have grown more than 5 fold in human populations, individually and as a group since 1950 (over the past 70 years), creating massive environmental change and destruction (ongoing) and declines in most types of non-domesticated vertebrates.

The audit revealed a number of potentially unnamed forms, although this paper names just four.

These are all taxa within the so-called “*Crotaphopeltis shrevei* Loveridge, 1932” species complex, being the divergent population from the Rondo Plateau in southern Tanzania, known to be divergent for many years, but as yet unnamed; another population from south-west Tanzania and nearby Malawi and Zambia; the population from around Goma and west of there in the North Kivu Province, of the Democratic Republic of Congo, as well as division of the recently described form *D. montisilva* Branch, Conradie and Tolley, 2019 from north-east Mozambique, this one being formally named as a subspecies rather than full species.

Taxonomic vandalism by way of pretending these forms are not unique, or by assigning them non-ICZN compliant duplicate names in breach of Copyright laws 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*; *Dipsadoboa*; Congo; Cameroon; Tanzania; Mozambique; Malawi; Rondo plateau; new species; *swileorum*; *euanedwardsi*; *paulwoolfi*; new subspecies; *nampulaensis*.

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 diversity in the genus *Crotaphopeltis* and the associated genus *Dipsadoboa* Günther 1858

as presently conceived by most publishing herpetologists was being underestimated.

Snakes of the genus *C. hotamboeia* (Laurenti, 1768) are dealt with

in a separate paper, published in 2023 at the same time as this paper.

In terms of the genus *Dipsadoboa*, I flagged at end 2009 an intention to name three forms from southern Tanzania and nearby countries to the west.

In terms of both genera, *Crotaphopeltis* and *Dipsadoboa* in particular, Bill Branch of Port Elizabeth, South Africa and close friend Don Broadley of Zimbabwe, made threats to anyone seeking to work on, or publish about either genus, claiming a monopoly on them and an intent to name the two forms I had recently flagged as new species in various online posts.

In the decade from 2009 to 2019, they both repeatedly stated an intent to be the persons naming any new taxa (including the two I had identified as unnamed), or at least be listed as co-authors in any planned papers naming any new species in the genera.

These outrageous demands in the first instance followed a review of the African Cobras published by myself (Raymond Hoser), domiciled in Melbourne, Victoria, Australia, early in 2019, and they viewed me as impinging on their hegemony of African herpetology and the “discovery” of new species there.

These demands also coincided with a series of police raids on people Branch and Broadley saw as being likely to publish descriptions of African reptile species over which they sought a hegemony over, which did a remarkable job in scaring off others in Africa and elsewhere with any inclination to name reptile species on that continent.

The result was that in terms of scientific descriptions of new reptile species and the like, Africa has probably fallen well behind every other continent on the planet and now probably has a greater percentage of unnamed reptile taxa than any other continent.

Combined with the fastest growing human population of all the continents (now in excess of 1.4 billion), Africa is on the cusp of a major man-made ecological Armageddon for many species of vertebrate.

Broadley and Branch, along with associates in crime Wolfgang Wüster and Mark O’Shea made numerous false complaints to the Australian wildlife authorities and police against me, resulting in several violent armed raids on our wildlife breeding facility and lab, most notably including “the big one” on 17 August 2011, effectively stalling or stopping the publication of dozens of important scientific papers, the screening of a series of 13 important 1 hour wildlife documentaries and loss of many years worth of scientific and collection records.

I note that it is also a matter of public record that both Broadley and his good friend Branch, were (separate of their activities in herpetology) found to have procured young black boys for anal sex over a period spanning many years, but over decades they evaded prosecution because of their high positions within government-owned Museums and close connections in law enforcement.

Don Broadley died on 10 March 2016, and this was followed by Bill Branch dying on 14 October 2018. I note that at the time, police had earlier that year in 2018, said that they were preparing to charge Branch with historical child sex offences, following ongoing protests from victims that did not let up.

However Broadley, the main perpetrator was never charged.

In any event, this meant that the various unnamed species I was aware of within the two genera *Crotaphopeltis* and *Dipsadoboa* were unnamed in 2022 and likely to remain unnamed indefinitely.

Significantly, a year after Branch’s death, he was listed as lead author in a paper (Branch *et al.* 2019) naming a new species of *Dipsadoboa* published online in the PRINO (peer reviewed in name only) journal *Zootaxa* (commonly called “Zootoxic”, for obvious reasons) (see also Hoser 2009, 2012a, 2012b, 2013, 2015a-f).

While Jesus Christ was reported to have returned from the dead a few days after his death in a book known simply as “*The Bible*”, Bill Branch seems to have exceeded that feat by a significant margin.

Engelbrecht *et al.* (2021) also listed Branch as a co-author on a paper dealing with *Crotaphopeltis* confirming Branch’s apparent resurrection from the dead some years after he “died”, but that paper failed to name any new species or subspecies, even though it published a detailed phylogeny flagging potentially unnamed forms I had identified and made known to others online in the decade preceding that publication.

Not to be outdone by Jesus Christ or Bill Branch, Don Broadley decided to continue publishing numerous papers for some years after his death, being listed as a co-author on numerous papers in the following years, including for example Trape *et al.* (2019), some three years after his death.

By the way, I must stress that there is no evidence that a religion is about to be set up celebrating the revival from the dead of Broadley, that will sacrifice young black boys for sex.

Nor to my knowledge has there yet been any petition to the Vatican for either of the two sex offenders to be Canonized as a result of the men apparently coming back from their graves long after they were declared dead. This is even though it is common knowledge that the senior clergy of the Catholic Church are quite partial to the idea of Canonizing strange people and having sex with little boys (BBC World 2021, Bowcott and Sherwood 2020, Lauer and Hoyer 2019).

I do note that cohort member, the rat-like Mark O’Shea has had his friends “shopping” him for fake honorary University degrees and Royal honours in the UK for some decades. He has repeatedly made it clear he will not give up until he succeeds, so a Canonization for Broadley or Branch arising from the apparent “miracle” of them coming back to life and engaging in herpetology for many years after their deaths is not out of the question.

In any event, in the two years since those above-mentioned papers were last published, it seems that Broadley and Branch have in fact finally died for the last time; no one else in the cohort are publicly known to be intending naming any new taxa in either genus and no new taxa in either genus have been formally named since 2019. Because as of end 2022 no one has publicly flagged any intention of doing so, it is unlikely anyone will be “offended” if I do what should have been done decades ago and that is to name the relevant unnamed forms.

I have made the assumption that after 2 years of apparent non-publication of further papers, that neither Branch or Broadley are going to emerge from their graves to have sex with the young boys they had sex with, as they are probably all grown up by now and Branch and Broadley are probably still worried about being charged for their historical sex offences.

In terms of the snakes of the genera *Crotaphopeltis* and *Dipsadoboa* it is self-evident that if I do not name the most obvious unnamed taxa now, their risk of extinction increases.

Therefore the main purpose of this paper is to formally identify and name four obviously unnamed forms within *Dipsadoboa* as is generally recognized.

MATERIALS AND METHODS

The audit in terms of the four putative species or subspecies named within this paper 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 and the three identified taxa within the *Dipsadoboa shrevei* group.

While in the field, no brutal snake tongs were used to handle any snakes (see Hoser, 2007b).

The putative taxon, originally named as “*Crotaphopeltis shrevei* Loveridge, 1932” was audited across its known distribution, including closely associated species.

After stripping those publications from consideration that were derivative, rather than original in nature, it soon became clear that very little had been published on the genus and the *Dipsadoboa shrevei* group in particular.

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?

In terms of the relevant candidate species, all were apparently constrained by elevation, with lowland areas or montane regions forming barriers between populations.

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.

For the record there were no available synonyms for the four forms formally named in this paper.

Literature relevant to the taxonomic and nomenclatural conclusions with respect of the populations of the above-mentioned species or species groups within *Dipsadoboa* Günther 1858 and putative "*Crotaphopeltis shrevei* Loveridge, 1932" in particular included: Auerbach (1987), Baptista *et al.* (2019), Barbour (1914), Barbour and Amaral (1927a, 1927b), Barbour and Loveridge (1928), Barnett (2001), Barnett and Emms (2005), Bates *et al.* (2014), Bayliss *et al.* (2014), Behangana *et al.* (2020), Beolens *et al.* (2011), Berry (1970), Bittencourt-Silva (2019), Böhme *et al.* (2011), Boulenger (1896, 1897a, 1897b, 1901, 1906, 1907), Boycott (1992), Branch (1993), Branch *et al.* (2005, 2019), Broadley (1958, 1959, 1962, 1968, 1991), Broadley and Blaylock (2013), Broadley and Cotterill (2004), Broadley and Howell (1991), Broadley and Stevens (1971), Broadley *et al.* (2003), Burger *et al.* (2004), Carlino and Pauwels (2015), Chabanaud (1916, 1917), Chifundera (1990), Chippaux and Jackson (2019), Chirio (2009), Chirio and Lebreton (2007), Chirio and Ineich (2006), Conradie and Branch (2016), Conradie *et al.* (2016a, 2016b, 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), Gans *et al.* (1965), Gemel *et al.* (2019), Gray (1858), Günther (1858, 1864, 1888, 1895), Haagner and Branch (1995), Haagner *et al.* (2000), Hallermann (1998, 2007), Harrington *et al.* (2018), 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), Köhler and Güsten (2007), Lanza (1983, 1990), Largen and Rasmussen (1993), Largen and Spawls (2010), Laurent (1956), Laurenti (1768), Lebreton (1999), Leaché *et al.* (2006), Lillywhite (2014), Lindholm (1905), Loveridge (1929, 1932, 1936, 1938a, 1938b, 1941, 1956, 1957), Lyakurwa (2017), Lyakurwa *et al.* (2019), Malonza *et al.* (2006, 2017), Marques *et al.* (2018), Masters *et al.* (2017), Matschie (1893), Mehrtens (1967), Menegon *et al.* (2008, 2014), Menzies (1966), Monard (1931, 1940), Monasterio (2016), Muchai and Malonza (2011), Müller (1910), Pauwels and Colyn (2023), Pauwels and David (2008), Pauwels and Vande Weghe (2008), Pauwels *et al.* (2002, 2004, 2006, 2016, 2019, 2022), Peters (1863, 1869), Pietersen *et al.* (2021), Pitman (1974), Pyron *et al.* (2013), Rasmussen (1981, 1985, 1986, 1989a, 1989b, 1993a, 1993b, 1997), Rasmussen and Huges (1996), Rasmussen *et al.* (2000), Razzetti and Msuya (2002), Reinhardt (1843), Ride *et al.* (1999), Robertson *et al.* (2003), Roman (1974), Rovero *et al.* (2014), Sanchez-Vialas *et al.* (2022), Schmidt (1923), Segniabeto *et al.* (2011, 2022), Schlüter and Hallermann (1997), Scortecci (1929, 1931), Seba (1734), Senter and Chippaux (2022), Smith (1849), Spawls *et al.* (2011, 2018), Sternfeld (1908, 1917), Tarn *et al.* (2018), Timberlake *et al.* (2012), 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.* (2019, 2020), Ullenbruch *et al.* (2010), Uthmüller (1939), Wallach *et al.* (2014), Werner (1897, 1899, 1908, 1909, 1913), Witte (1933), Zassi-Boulou *et al.* (2020) and sources cited therein.

RESULTS

The four candidate species were all shown to be either morphologically divergent (as detailed in the descriptions below), divergent by way of molecular evidence that had been previously published (as cited above), or both.

The three most obviously divergent forms are herein named as species in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

A less divergent form is formally named as a subspecies.

These newly named forms are *Dipsadoboa swileorum* sp. nov. from Rondo Plateau, south-east Tanzania; *Dipsadoboa euanedwardsi* sp. nov. from the hilly areas of south-west Tanzania and nearby Malawi and Zambia, mainly south of Lake Rukwa; *Dipsadoboa paulwoolfi* sp. nov. from around Goma and west of there in the North Kivu Province, of the Democratic Republic of Congo; as well as division of the recently described form *D. montisilva* Branch, Conradie and Tolley, 2019 from north-east

Mozambique, the population from M'páluwé Ridge Forest, Ribáué Massif, Nampula Province, Mozambique, north-east of the main population is herein formally named as a subspecies *D. montisilva nampulaensis* subsp. nov. rather than as a full species.

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 21 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, including by way of breaching international copyright laws, should be resisted (e.g. Cogger 2014, Wellington 2015, Dubois *et al.* 2019, Mosyakin 2022 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 gang 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).

CONSERVATION THREATS TO THE NEWLY NAMED TAXA AND RELATIVES

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

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

DIPSADOBOA SWILEORUM SP. NOV.

LSIDurn:lsid:zoobank.org:act:F1FAD065-F194-45D1-B615-1C0F9333151B

Holotype: A preserved specimen in the Museum of Natural History, London, UK, specimen number: BMNH 1958.1.6.40 collected from Mtene, Rondo Plateau, Tanzania, Africa, Latitude 10.1500 S., Longitude -39.3333 E. This facility allows access to its holdings.

Paratype: A preserved specimen in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ 57434 collected from Lindi, Mtene, Rondo Plateau, Tanzania, Latitude 10.1500 S., Longitude -39.3333 E.

Diagnosis: Until now, putative *Dipsadoboa shrevei* (Loveridge, 1932), type locality Missas de Dondi, Bella Vista, Lubito, Angola (near the Atlantic Ocean) originally placed in the genus *Crotaphopeltis* Fitzinger, 1843, has been treated as a wide-ranging sub-Saharan species with a range extending from the type locality, west Angola, east through the Southern Democratic Republic of Congo (Kinshasa), North Zambia, Mozambique and Tanzania. Morphological studies (e.g. Rasmussen 1986), and molecular studies (e.g. Branch *et al.* 2019) have confirmed the obvious, in that there are several species within the group.

Rasmussen (1986) had already formally separated the related taxon *Dipsadoboa wernerii* (Boulenger, 1897), a species endemic to the Usambara Mountains, in Tanzania, as well as *Dipsadoboa kageleri* (Uthmüller, 1939), apparently endemic to the Kilimanjaro area of Tanzania, with diagnostic differences.

Branch *et al.* (2019) formally named *Dipsadoboa montisilva* Branch, Conradie and Tolley, 2019, with a type locality of Mount Mabu in north Mozambique, providing both a morphological and molecular basis for doing so.

The other obviously unnamed species in this complex are formally named herein as follows:

1/ *Dipsadoboa swileorum sp. nov.* is the divergent form long known to inhabit the Rondo Plateau, south-east Tanzania;

2/ *Dipsadoboa euanedwardsi sp. nov.* occurs in the hilly areas of south-west Tanzania and nearby Malawi and Zambia, mainly south of Lake Rukwa;

3/ *Dipsadoboa paulwoolffi sp. nov.* is the taxon found from around Goma and west of there in the North Kivu Province, of the Democratic Republic of Congo.

4/ Furthermore an isolated population of *D. montisilva* from the M'páluwé Ridge Forest, Ribáué Massif, Nampula Province, Mozambique is formally named as a subspecies, *D. montisilva nampulaensis subsp. nov.*

The eight preceding forms are separated from one another as follows:

1/ *Dipsadoboa shrevei* (Loveridge, 1932), *sensu stricto* has the following unique suite of characters:

dorsals in 19-19-15 (rarely 14) rows; ventrals 203-214 in males and 199-213 in females, anal entire (or rarely divided); subcaudals 74-83 in males and 75-85 in females, 11-16+II maxillary teeth; no vestigial tooth behind the fang; juveniles pale without any distinct markings, becoming darker (brownish, grey, or blue-black, including anteriorly and on the upper labials) with increasing size and age, but invariably with a substantial amount of green or greenish pigment in adults.

2/ *D. wernerii* (Boulenger, 1897) is separated from the preceding species and the other six, by having dorsals in 19-19-13 (rarely 15) rows; 221 to 229 ventrals in males and 212-221 in females; 102-111 subcaudals in males and 98-106 in females; 15-16+II+1 maxillary teeth; juveniles with a characteristic pattern of cross-

bands, which disappear in the adults which have a more or less uniform ground color (yellow-brown to pale grey) with dark-edged scales.

3/ *D. kageleri* (Uthmüller, 1939), has the following unique suite of characters: dorsals in 17-17-13 rows; 191 ventrals in males and 195 in females (n=1 of each), anal divided; 72 subcaudals in each sex (n=1 for each) 14+II+1 maxillary teeth, color similar to the that of adult color of *D. shrevei*.

4/ *D. montisilva* Branch, Conradie and Tolley, 2019 has the following unique suite of characters: 19-19-15 scale rows; 194-210 ventrals in males, 194-201 in females; 95-100 subcaudals in males, 98-90 in females; usually only two supralabials (4-5) entering the eye (three supralabials (3-5) in the other species), 1+1 or 1+2 temporals (1+1 in the others, except *D. wernerii* with 1+2), and an entire anal.

5/ *D. swileorum sp. nov.* is similar in most respects to *D. shrevei* as described above, but with 209 ventrals and 96 subcaudals (females), versus 199-213 ventrals and 75-85 subcaudals for females in *D. shrevei*, and the presence of a vestigial tooth behind the fang.

Adult *D. swileorum sp. nov.* do not darken substantially as they age, as is seen in *D. shrevei*, being generally olive-brownish in colour.

6/ *D. euanedwardsi sp. nov.* is similar in most respects to both *D. swileorum sp. nov.* and *D. shrevei* as described above, but is separated from *D. shrevei* by possession of a vestigial tooth behind the fang (absent in *D. shrevei*) as well as a female ventral count of 199-204 and female subcaudal count of 75-81 (versus 209 and 75-85 in *D. swileorum sp. nov.*). Adults are a mainly gun-metal grey with darker head and barely any hint of green at all.

See examples online at:

<https://www.inaturalist.org/observations/1170259>

and

<https://www.inaturalist.org/observations/22938012>

and

<https://www.flickr.com/photos/nvoaden/15218910294/>

7/ *D. paulwoolffi sp. nov.* is similar in most respects to each of *D. swileorum sp. nov.*, *D. euanedwardsi sp. nov.* (in terms of adult colouration) and *D. shrevei* as described above, but separated from each of the others by having a male ventral and subcaudal count of 215-219 and 86-91, versus 213 or less ventrals in each of *D. euanedwardsi sp. nov.* and *D. shrevei* and is separated from each of *D. euanedwardsi sp. nov.* and *D. swileorum sp. nov.* by the absence of a vestigial tooth behind the fang.

Other differences between *D. paulwoolffi sp. nov.* and the other taxa are spelt out in the table on top of page 66 of Rasmussen (1986).

8/ *D. montisilva nampulaensis subsp. nov.* is separated from nominate *D. montisilva* by the following character suite: 194 ventrals (N=1), versus 195-210 ventrals in *D. montisilva* (N=6); supralabials 3-5 entering the orbit, versus supralabials 4-5 entering the orbit in *D. montisilva*; a dorsum and venter that is a washed out light brown colour, dorsally and ventrally (venter light beige to cream in colour), versus dark olive-brown dorsally with an orange belly in *D. montisilva*, although it should be noted that colour intensity does increase slightly with age in specimens of this genus. The preceding species dubbed the *D. wernerii* group by Branch *et al.* (2019) are separated from all other members of the genus *Dipsadoboa* Fitzinger, 1843 by having divided subcaudals (single in the so-called *D. unicolor* group), an entire anal (divided in the so-called *D. aulica* group), and 19 midbody scale rows (17 in the *D. duchesnii* group, ... see below).

Snakes in the genus *Dipsadoboa* Fitzinger, 1843 are separated from all other African Snakes by the following unique suite of characters: Body not worm-like, no large pits on the labials or head shields; body not muscular; no paddle-like tail, one or more pairs of grooved venom fangs at the rear of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular; dorsum is not marbled red-brown or yellow; 194-270 ventrals; 100 or less subcaudals; usually a single anal; anterior temporal shield is single (modified

from Spawls *et al.* 2011).

Putative "*Leptodira duchesnii* Boulenger, 1901", treated by most recent authors, including Branch *et al.* (2019) as being within *Dipsadoboa* Fitzinger, 1843 is nothing like the other members, being both morphologically divergent (wholly arboreal), much larger eyes, more bulbous head, etc and should be placed in a separate genus. The name *Dipsoglyphophis* Barbour and Amaral, 1927 is available as noted by Loveridge, 1941.

Loveridge, 1941 also regarded "*Leptodira duchesnii* Boulenger, 1901" as being a species complex warranting further investigations, which nearly a century later has yet to be done.

Distribution: *Dipsadoboa swileorum* sp. nov. is only known from the environs of the Rondo Plateau, south-east Tanzania.

Etymology: *Dipsadoboa swileorum* sp. nov. is named in honour of the South African Swile family, from Cape Town, South Africa, including Benjamin Swile, Ernest Swile, Verona Swile, Marle Swile in recognition of logistics and assistance in herpetological fieldwork projects across southern Africa.

DIPSADOBOA EUANEDWARDSI SP. NOV.

LSIDurn:lsid:zoobank.org:act:E1A5861F-E922-441F-9C01-B3CA053DE88D

Holotype: A preserved specimen in the Institut royal des Sciences naturelles de Belgique, Brussels, Belgium, specimen number IRScNB 8748 collected from Mbala (formerly Abercorn), Zambia, Africa, Latitude 8.8536 S., Longitude 31.3656 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Museum of Comparative Zoology, Harvard, Cambridge, Massachusetts, USA, specimen number MCZ 554871 collected from Mbala (formerly Abercorn), Zambia, Latitude 8.8536 S., Longitude 31.3656 E.

2/ A preserved specimen at the Museum of Natural History, London, UK, specimen number BMNH 1907.10.14.2 collected from the Tanganyika Plateau (now in Zambia), Africa.

Diagnosis: Until now, putative *Dipsadoboa shrevei* (Loveridge, 1932), type locality Missas de Dondi, Bella Vista, Lubito, Angola (near the Atlantic Ocean) originally placed in the genus *Crotaphopeltis* Fitzinger, 1843, has been treated as a wide-ranging sub-Saharan species with a range extending from the type locality, west Angola, east through the Southern Democratic Republic of Congo (Kinshasa), North Zambia, Mozambique and Tanzania. Morphological studies (e.g. Rasmussen 1986), and molecular studies (e.g. Branch *et al.* 2019) have confirmed the obvious, in that there are several species within the group.

Rasmussen (1986) had already formally separated the related taxon *Dipsadoboa wernerii* (Boulenger, 1897), a species endemic to the Usambara Mountains, in Tanzania, as well as *Dipsadoboa kageleri* (Uthmüller, 1939), apparently endemic to the Kilimanjaro area of Tanzania, with diagnostic differences.

Branch *et al.* (2019) formally named *Dipsadoboa montisilva* Branch, Conradie and Tolley, 2019, with a type locality of Mount Mabu in north Mozambique, providing both a morphological and molecular basis for doing so.

The other obviously unnamed species in this complex are formally named herein as follows:

1/ *Dipsadoboa swileorum* sp. nov. is the divergent form long known to inhabit the Rondo Plateau, south-east Tanzania;

2/ *Dipsadoboa euanedwardsi* sp. nov. occurs in the hilly areas of south-west Tanzania and nearby Malawi and Zambia, mainly south of Lake Rukwa;

3/ *Dipsadoboa paulwoolffi* sp. nov. is the taxon found from around Goma and west of there in the North Kivu Province, of the Democratic Republic of Congo.

4/ Furthermore an isolated population of *D. montisilva* from the M'páluwé Ridge Forest, Ribáué Massif, Nampula Province, Mozambique is formally named as a subspecies, *D. montisilva nampulaensis* subsp. nov..

The eight preceding forms are separated from one another as follows:

1/ *Dipsadoboa shrevei* (Loveridge, 1932), *sensu stricto* has the

following unique suite of characters:

dorsals in 19-19-15 (rarely 14) rows; ventrals 203-214 in males and 199-213 in females, anal entire (or rarely divided); subcaudals 74-83 in males and 75-85 in females, 11-16+II maxillary teeth; no vestigial tooth behind the fang; juveniles pale without any distinct markings, becoming darker (brownish, grey, or blue-black, including anteriorly and on the upper labials) with increasing size and age, but invariably with a substantial amount of green or greenish pigment in adults.

2/ *D. wernerii* (Boulenger, 1897) is separated from the preceding species and the other six, by having dorsals in 19-19-13 (rarely 15) rows; 221 to 229 ventrals in males and 212-221 in females; 102-111 subcaudals in males and 98-106 in females; 15-16+II+1 maxillary teeth; juveniles with a characteristic pattern of cross-bands, which disappear in the adults which have a more or less uniform ground color (yellow-brown to pale grey) with dark-edged scales.

3/ *D. kageleri* (Uthmüller, 1939), has the following unique suite of characters: dorsals in 17-17-13 rows; 191 ventrals in males and 195 in females (n=1 of each), anal divided; 72 subcaudals in each sex (n=1 for each) 14+II+1 maxillary teeth, color similar to the that of adult color of *D. shrevei*.

4/ *D. montisilva* Branch, Conradie and Tolley, 2019 has the following unique suite of characters: 19-19-15 scale rows; 194-210 ventrals in males, 194-201 in females; 95-100 subcaudals in males, 98-90 in females; usually only two supralabials (4-5) entering the eye (three supralabials (3-5) in the other species), 1+1 or 1+2 temporals (1+1 in the others, except *D. wernerii* with 1+2), and an entire anal.

5/ *D. swileorum* sp. nov. is similar in most respects to *D. shrevei* as described above, but with 209 ventrals and 96 subcaudals (females), versus 199-213 ventrals and 75-85 subcaudals for females in *D. shrevei*, and the presence of a vestigial tooth behind the fang.

Adult *D. swileorum* sp. nov. do not darken substantially as they age, as is seen in *D. shrevei*, being generally olive-brownish in colour.

6/ *D. euanedwardsi* sp. nov. is similar in most respects to both *D. swileorum* sp. nov. and *D. shrevei* as described above, but is separated from *D. shrevei* by possession of a vestigial tooth behind the fang (absent in *D. shrevei*) as well as a female ventral count of 199-204 and female subcaudal count of 75-81 (versus 209 and 75-85 in *D. swileorum* sp. nov.). Adults are a mainly gun-metal grey with darker head and barely any hint of green at all.

See examples online at:

<https://www.inaturalist.org/observations/1170259>

and

<https://www.inaturalist.org/observations/22938012>

and

<https://www.flickr.com/photos/nvoaden/15218910294/>

7/ *D. paulwoolffi* sp. nov. is similar in most respects to each of *D. swileorum* sp. nov., *D. euanedwardsi* sp. nov. (in terms of adult colouration) and *D. shrevei* as described above, but separated from each of the others by having a male ventral and subcaudal count of 215-219 and 86-91, versus 213 or less ventrals in each of *D. euanedwardsi* sp. nov. and *D. shrevei* and is separated from each of *D. euanedwardsi* sp. nov. and *D. swileorum* sp. nov. by the absence of a vestigial tooth behind the fang.

Other differences between *D. paulwoolffi* sp. nov. and the other taxa are spelt out in the table on top of page 66 of Rasmussen (1986).

8/ *D. montisilva nampulaensis* subsp. nov. is separated from nominate *D. montisilva* by the following character suite: 194 ventrals (N=1), versus 195-210 ventrals in *D. montisilva* (N=6); supralabials 3-5 entering the orbit, versus supralabials 4-5 entering the orbit in *D. montisilva*; a dorsum and venter that is a washed out light brown colour, dorsally and ventrally (venter light beige to cream in colour), versus dark olive-brown dorsally with an orange belly in *D. montisilva*, although it should be noted that colour intensity does increase slightly with age in specimens of this genus. The preceding species dubbed the *D. wernerii* group by Branch

et al. (2019) are separated from all other members of the genus *Dipsadoboa* Fitzinger, 1843 by having divided subcaudals (single in the so-called *D. unicolor* group), an entire anal (divided in the so-called *D. aulica* group), and 19 midbody scale rows (17 in the *D. duchesnii* group, ... see below).

Snakes in the genus *Dipsadoboa* Fitzinger, 1843 are separated from all other African Snakes by the following unique suite of characters: Body not worm-like, no large pits on the labials or head shields; body not muscular; no paddle-like tail, one or more pairs of grooved venom fangs at the rear of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular; dorsum is not marbled red-brown or yellow; 194-270 ventrals; 100 or less subcaudals; usually a single anal; anterior temporal shield is single (modified from Spawls *et al.* 2011).

Putative "*Leptodira duchesnii* Boulenger, 1901", treated by most recent authors, including Branch *et al.* (2019) as being within *Dipsadoboa* Fitzinger, 1843 is nothing like the other members, being both morphologically divergent (wholly arboreal), much larger eyes, bulbous head, substantially different scalation, etc and should be placed in a separate genus. The name *Dipsoglyphophis* Barbour and Amaral, 1927 is available as noted by Loveridge (1941).

Loveridge, 1941 also regarded "*Leptodira duchesnii* Boulenger, 1901" as recognized at the time (and still now), as in fact being a species complex and warranting further investigations, which nearly a century later has yet to be done.

Distribution: *Dipsadoboa euanedwardsi* sp. nov. is only known from the environs of the type locality and the adjacent parts of the Luangwa River Valley, including Zambia, nearby parts of Malawi and presumably adjacent Tanzania.

Etymology: *Dipsadoboa euanedwardsi* sp. nov. is named in honour of the now Australian-based herpetologist Euan Edwards of the Gold Coast, Queensland, in recognition of a life-time's work in herpetology, including considerable fieldwork over many years in most parts of Africa, including the region this species occurs.

DIPSADOBOA PAULWOOLFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:301433B3-18E7-41FF-9434-71C850CC5187

Holotype: A preserved specimen in the Royal Museum for Central Africa (Musée royal d'Afrique centrale), Tervuren, Belgium, specimen number RGMC 18516, collected from Uvira, Kivu, Democratic Republic of Congo (DRC) (Kinshasa), Latitude -32.2212 S., Longitude 29.0824 E.

This facility allows access to its holdings.

Paratype: A preserved specimen in the Royal Museum for Central Africa (Musée royal d'Afrique centrale), Tervuren, Belgium, specimen number RGMC 18517 collected from Makungu, 950 m, Terr. de Fizi, Kivu, Democratic Republic of Congo (DRC) (Kinshasa).

Diagnosis: Until now, putative *Dipsadoboa shrevei* (Loveridge, 1932), type locality Missas de Dondi, Bella Vista, Lubito, Angola (near the Atlantic Ocean) originally placed in the genus *Crotaphopeltis* Fitzinger, 1843, has been treated as a wide-ranging sub-Saharan species with a range extending from the type locality, west Angola, east through the Southern Democratic Republic of Congo (Kinshasa), North Zambia, Mozambique and Tanzania.

Morphological studies (e.g. Rasmussen 1986), and molecular studies (e.g. Branch *et al.* 2019) have confirmed the obvious, in that there are several species within the group.

Rasmussen (1986) had already formally separated the related taxon *Dipsadoboa wernerii* (Boulenger, 1897), a species endemic to the Usambara Mountains, in Tanzania, as well as *Dipsadoboa kageleri* (Uthmüller, 1939), apparently endemic to the Kilimanjaro area of Tanzania, with diagnostic differences.

Branch *et al.* (2019) formally named *Dipsadoboa montisilva* Branch, Conradie and Tolley, 2019, with a type locality of Mount Mabu in north Mozambique, providing both a morphological and molecular basis for doing so.

The other obviously unnamed species in this complex are formally

named herein as follows:

1/ *Dipsadoboa swileorum* sp. nov. is the divergent form long known to inhabit the Rondo Plateau, south-east Tanzania;

2/ *Dipsadoboa euanedwardsi* sp. nov. occurs in the hilly areas of south-west Tanzania and nearby Malawi and Zambia, mainly south of Lake Rukwa;

3/ *Dipsadoboa paulwoolfi* sp. nov. is the taxon found from around Goma and west of there in the North Kivu Province, of the Democratic Republic of Congo.

4/ Furthermore an isolated population of *D. montisilva* from the M'pâlúwé Ridge Forest, Ribáué Massif, Nampula Province, Mozambique is formally named as a subspecies, *D. montisilva nampulaensis* subsp. nov.

The eight preceding forms are separated from one another as follows:

1/ *Dipsadoboa shrevei* (Loveridge, 1932), *sensu stricto* has the following unique suite of characters:

dorsals in 19-19-15 (rarely 14) rows; ventrals 203-214 in males and 199-213 in females, anal entire (or rarely divided); subcaudals 74-83 in males and 75-85 in females, 11-16+II maxillary teeth; no vestigial tooth behind the fang; juveniles pale without any distinct markings, becoming darker (brownish, grey, or blue-black, including anteriorly and on the upper labials) with increasing size and age, but invariably with a substantial amount of green or greenish pigment in adults.

2/ *D. wernerii* (Boulenger, 1897) is separated from the preceding species and the other six, by having dorsals in 19-19-13 (rarely 15) rows; 221 to 229 ventrals in males and 212-221 in females; 102-111 subcaudals in males and 98-106 in females; 15-16+II+1 maxillary teeth; juveniles with a characteristic pattern of cross-bands, which disappear in the adults which have a more or less uniform ground color (yellow-brown to pale grey) with dark-edged scales.

3/ *D. kageleri* (Uthmüller, 1939), has the following unique suite of characters: dorsals in 17-17-13 rows; 191 ventrals in males and 195 in females (n=1 of each), anal divided; 72 subcaudals in each sex (n=1 for each) 14+II+1 maxillary teeth, color similar to the that of adult color of *D. shrevei*.

4/ *D. montisilva* Branch, Conradie and Tolley, 2019 has the following unique suite of characters: 19-19-15 scale rows; 194-210 ventrals in males, 194-201 in females; 95-100 subcaudals in males, 98-90 in females; usually only two supralabials (4-5) entering the eye (three supralabials (3-5) in the other species), 1+1 or 1+2 temporals (1+1 in the others, except *D. wernerii* with 1+2), and an entire anal.

5/ *D. swileorum* sp. nov. is similar in most respects to *D. shrevei* as described above, but with 209 ventrals and 96 subcaudals (females), versus 199-213 ventrals and 75-85 subcaudals for females in *D. shrevei*, and the presence of a vestigial tooth behind the fang.

Adult *D. swileorum* sp. nov. do not darken substantially as they age, as is seen in *D. shrevei*, being generally olive-brownish in colour.

6/ *D. euanedwardsi* sp. nov. is similar in most respects to both *D. swileorum* sp. nov. and *D. shrevei* as described above, but is separated from *D. shrevei* by possession of a vestigial tooth behind the fang (absent in *D. shrevei*) as well as a female ventral count of 199-204 and female subcaudal count of 75-81 (versus 209 and 75-85 in *D. swileorum* sp. nov.). Adults are a mainly gun-metal grey with darker head and barely any hint of green at all.

See examples online at:

<https://www.inaturalist.org/observations/1170259>

and

<https://www.inaturalist.org/observations/22938012>

and

<https://www.flickr.com/photos/nvoaden/15218910294/>

7/ *D. paulwoolfi* sp. nov. is similar in most respects to each of *D. swileorum* sp. nov., *D. euanedwardsi* sp. nov. (in terms of adult colouration) and *D. shrevei* as described above, but separated from each of the others by having a male ventral and subcaudal

count of 215-219 and 86-91, versus 213 or less ventrals in each of *D. euanedwardsi* sp. nov. and *D. shrevei* and is separated from each of *D. euanedwardsi* sp. nov. and *D. swileorum* sp. nov. by the absence of a vestigial tooth behind the fang.

Other differences between *D. paulwoolfi* sp. nov. and the other taxa are spelt out in the table on top of page 66 of Rasmussen (1986).

8/ *D. montisilva nampulaensis* subsp. nov. is separated from nominate *D. montisilva* by the following character suite: 194 ventrals (N=1), versus 195-210 ventrals in *D. montisilva* (N=6); supralabials 3-5 entering the orbit, versus supralabials 4-5 entering the orbit in *D. montisilva*; a dorsum and venter that is a washed out light brown colour, dorsally and ventrally (venter light beige to cream in colour), versus dark olive-brown dorsally with an orange belly in *D. montisilva*, although it should be noted that colour intensity does increase slightly with age in specimens of this genus. The preceding species dubbed the *D. wernerii* group by Branch *et al.* (2019) are separated from all other members of the genus *Dipsadoboa* Fitzinger, 1843 by having divided subcaudals (single in the so-called *D. unicolor* group), an entire anal (divided in the so-called *D. aulica* group), and 19 midbody scale rows (17 in the *D. duchesnii* group, ... see below).

Snakes in the genus *Dipsadoboa* Fitzinger, 1843 are separated from all other African Snakes by the following unique suite of characters: Body not worm-like, no large pits on the labials or head shields; body not muscular; no paddle-like tail, one or more pairs of grooved venom fangs at the rear of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular; dorsum is not marbled red-brown or yellow; 194-270 ventrals; 100 or less subcaudals; usually a single anal; anterior temporal shield is single (modified from Spawls *et al.* 2011).

Putative "*Leptodira duchesnii* Boulenger, 1901", treated by most recent authors, including Branch *et al.* (2019) as being within *Dipsadoboa* Fitzinger, 1843 is nothing like the other members, being both morphologically divergent (wholly arboreal), much larger eyes, bulbous head, substantially different scalation, etc and should be placed in a separate genus. The name *Dipsoglyphophis* Barbour and Amaral, 1927 is available as noted by Loveridge (1941).

Loveridge, 1941 also regarded "*Leptodira duchesnii* Boulenger, 1901" as recognized at the time (and still now), as in fact being a species complex and warranting further investigations, which nearly a century later has yet to be done.

Distribution: *Dipsadoboa paulwoolfi* sp. nov. is only known from the environs of the type locality Kivu, Democratic Republic of Congo, with the extent of distribution beyond here yet to be determined.

Etymology: *Dipsadoboa paulwoolfi* sp. nov. is named in honour of the Australian-based herpetologist Paul Woolf of the Walloon, Queensland, in recognition of a life-time's work in herpetology, including as foundation president of the Herpetological Society of Queensland Incorporated, including for his leading role in combating taxonomic vandalism by Hinrich (Code-wrecker) Kaiser, Wolfgang Wüster, Don Broadley and their cohort and encouraging other herpetologists to publicly condemn their copyright infringing, ICZN Code wrecking, illegal and dishonest practices (see Hoser 2015a-f).

DIPSADOBOA MONTISILVA NAMPULAENSIS SUBSP. NOV.
LSIDDurn:lsid:zoobank.org:act:F3649C7A-4F1D-41B0-BD11-282B74D97A43

Holotype: A preserved young female specimen in the Port Elizabeth Museum, South Africa, now known as Bayworld, Gqeberha, South Africa, specimen number PEM R21195, collected from M'páluwé Ridge Forest, Ribáuè Massif, Nampula Province, Mozambique, Africa.

This facility allows access to its holdings.

Diagnosis: Until now, putative *Dipsadoboa shrevei* (Loveridge, 1932), type locality Missas de Dondi, Bella Vista, Lubito, Angola (near the Atlantic Ocean) originally placed in the genus *Crotaphopeltis* Fitzinger, 1843, has been treated as a wide-ranging

sub-Saharan species with a range extending from the type locality, west Angola, east through the Southern Democratic Republic of Congo (Kinshasa), North Zambia, Mozambique and Tanzania.

Morphological studies (e.g. Rasmussen 1986), and molecular studies (e.g. Branch *et al.* 2019) have confirmed the obvious, in that there are several species within the group.

Rasmussen (1986) had already formally separated the related taxon *Dipsadoboa wernerii* (Boulenger, 1897), a species endemic to the Usambara Mountains, in Tanzania, as well as *Dipsadoboa kageleri* (Uthmüller, 1939), apparently endemic to the Kilimanjaro area of Tanzania, with diagnostic differences.

Branch *et al.* (2019) formally named *Dipsadoboa montisilva* Branch, Conradie and Tolley, 2019, with a type locality of Mount Mabu in north Mozambique, providing both a morphological and molecular basis for doing so.

The other obviously unnamed species in this complex are formally named herein as follows:

1/ *Dipsadoboa swileorum* sp. nov. is the divergent form long known to inhabit the Rondo Plateau, south-east Tanzania;

2/ *Dipsadoboa euanedwardsi* sp. nov. occurs in the hilly areas of south-west Tanzania and nearby Malawi and Zambia, mainly south of Lake Rukwa;

3/ *Dipsadoboa paulwoolfi* sp. nov. is the taxon found from around Goma and west of there in the North Kivu Province, of the Democratic Republic of Congo.

4/ Furthermore an isolated population of *D. montisilva* from the M'páluwé Ridge Forest, Ribáuè Massif, Nampula Province, Mozambique is formally named as a subspecies, *D. montisilva nampulaensis* subsp. nov..

The eight preceding forms are separated from one another as follows:

1/ *Dipsadoboa shrevei* (Loveridge, 1932), *sensu stricto* has the following unique suite of characters:

dorsals in 19-19-15 (rarely 14) rows; ventrals 203-214 in males and 199-213 in females, anal entire (or rarely divided); subcaudals 74-83 in males and 75-85 in females, 11-16+II maxillary teeth; no vestigial tooth behind the fang; juveniles pale without any distinct markings, becoming darker (brownish, grey, or blue-black, including anteriorly and on the upper labials) with increasing size and age, but invariably with a substantial amount of green or greenish pigment in adults.

2/ *D. wernerii* (Boulenger, 1897) is separated from the preceding species and the other six, by having dorsals in 19-19-13 (rarely 15) rows; 221 to 229 ventrals in males and 212-221 in females; 102-111 subcaudals in males and 98-106 in females; 15-16+II+1 maxillary teeth; juveniles with a characteristic pattern of cross-bands, which disappear in the adults which have a more or less uniform ground color (yellow-brown to pale grey) with dark-edged scales.

3/ *D. kageleri* (Uthmüller, 1939), has the following unique suite of characters: dorsals in 17-17-13 rows; 191 ventrals in males and 195 in females (n=1 of each), anal divided; 72 subcaudals in each sex (n=1 for each) 14+II+1 maxillary teeth, color similar to the that of adult color of *D. shrevei*.

4/ *D. montisilva* Branch, Conradie and Tolley, 2019 has the following unique suite of characters: 19-19-15 scale rows; 194-210 ventrals in males, 194-201 in females; 95-100 subcaudals in males, 98-90 in females; usually only two supralabials (4-5) entering the eye (three supralabials (3-5) in the other species), 1+1 or 1+2 temporals (1+1 in the others, except *D. wernerii* with 1+2), and an entire anal.

5/ *D. swileorum* sp. nov. is similar in most respects to *D. shrevei* as described above, but with 209 ventrals and 96 subcaudals (females), versus 199-213 ventrals and 75-85 subcaudals for females in *D. shrevei*, and the presence of a vestigial tooth behind the fang.

Adult *D. swileorum* sp. nov. do not darken substantially as they age, as is seen in *D. shrevei*, being generally olive-brownish in colour.

6/ *D. euanedwardsi* sp. nov. is similar in most respects to both

D. swileorum sp. nov. and *D. shrevei* as described above, but is separated from *D. shrevei* by possession of a vestigial tooth behind the fang (absent in *D. shrevei*) as well as a female ventral count of 199-204 and female subcaudal count of 75-81 (versus 209 and 75-85 in *D. swileorum* sp. nov.). Adults are a mainly gun-metal grey with darker head and barely any hint of green at all.

See examples online at:

<https://www.inaturalist.org/observations/1170259>

and

<https://www.inaturalist.org/observations/22938012>

and

<https://www.flickr.com/photos/nvoaden/15218910294/>

7/ *D. paulwoolfi* sp. nov. is similar in most respects to each of *D. swileorum* sp. nov., *D. euanedwardsi* sp. nov. (in terms of adult colouration) and *D. shrevei* as described above, but separated from each of the others by having a male ventral and subcaudal count of 215-219 and 86-91, versus 213 or less ventrals in each of *D. euanedwardsi* sp. nov. and *D. shrevei* and is separated from each of *D. euanedwardsi* sp. nov. and *D. swileorum* sp. nov. by the absence of a vestigial tooth behind the fang.

Other differences between *D. paulwoolfi* sp. nov. and the other taxa are spelt out in the table on top of page 66 of Rasmussen (1986).

8/ *D. montisilva nampulaensis* subsp. nov. is separated from nominate *D. montisilva* by the following character suite: 194 ventrals (N=1), versus 195-210 ventrals in *D. montisilva* (N=6); supralabials 3-5 entering the orbit, versus supralabials 4-5 entering the orbit in *D. montisilva*; a dorsum and venter that is a washed out light brown colour, dorsally and ventrally (venter light beige to cream in colour), versus dark olive-brown dorsally with an orange belly in *D. montisilva*, although it should be noted that colour intensity does increase slightly with age in specimens of this genus.

The preceding species dubbed the *D. wernerii* group by Branch *et al.* (2019) are separated from all other members of the genus *Dipsadoboa* Fitzinger, 1843 by having divided subcaudals (single in the so-called *D. unicolor* group), an entire anal (divided in the so-called *D. aulica* group), and 19 midbody scale rows (17 in the *D. duchesnii* group, ... see below).

Snakes in the genus *Dipsadoboa* Fitzinger, 1843 are separated from all other African Snakes by the following unique suite of characters: Body not worm-like, no large pits on the labials or head shields; body not muscular; no paddle-like tail, one or more pairs of grooved venom fangs at the rear of the upper jaw; pupil vertically elliptic; head is much broader than the neck; loreal excluded from the orbit by the preocular; dorsum is not marbled red-brown or yellow; 194-270 ventrals; 100 or less subcaudals; usually a single anal; anterior temporal shield is single (modified from Spawls *et al.* 2011). Putative "*Leptodira duchesnii* Boulenger, 1901", treated by most recent authors, including Branch *et al.* (2019) as being within *Dipsadoboa* Fitzinger, 1843 is nothing like the other members, being both morphologically divergent (wholly arboreal), much larger eyes, bulbous head, substantially different scalation, etc and should be placed in a separate genus. The name *Dipsoglyphophis* Barbour and Amaral, 1927 is available as noted by Loveridge (1941).

Loveridge, 1941 also regarded "*Leptodira duchesnii* Boulenger, 1901" as recognized at the time (and still now), as in fact being a species complex and warranting further investigations, which nearly a century later has yet to be done.

Distribution: *Dipsadoboa montisilva nampulaensis* subsp. nov. is known only from the type locality, the M'pâlúwé Ridge Forest, Ribáuê Massif, Nampula Province, Mozambique. It is quite likely to be a range-restricted endemic, confined to the environs of the Ribáuê Massif, necessitating the urgent protection of the remaining undisturbed parts of this area.

Etymology: *D. montisilva nampulaensis* subsp. nov. is named in reflection of where it is known to occur.

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 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.

Unforseen 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.

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), (and see also Mitchell (1948) and Peters (1863)).

REFERENCES CITED

- Auerbach, R. D. 1987. *The Amphibians and Reptiles of Botswana*. Mokwepa Consultants, Botswana: 295 pp.
- Baptista, N. L., António, T. and Branch, W. R. 2019. The herpetofauna of Bicular National Park and surroundings, southwestern Angola: a preliminary checklist. *Amphibian and Reptile Conservation* 13(2):96-130.
- Barbour, T. 1914. Some new reptiles. *Proceedings of the New England Zoological Club* 4:95-98.
- Barbour, T. and Amaral, A. D. 1927a. Studies on African ophidia. *Bulletin of the Antiven Institute of America* 1(1):1-3.
- Barbour, T. and Amaral, A. D. 1927b. Studies on African Ophidia. *Bulletin of the Antiven Institute of America* 1(1):25-27.
- Barbour, T. and Loveridge, A. 1928. A comparative study of the herpetofauna of the Uluguru and Usambara mountains, Tanzania Territory with descriptions of new species. *Mem. Museum of Comparative Zoology Cambridge* (Massachusetts), 50(2):85-265.
- Barnett, L. K. 2001. The herpetofauna of Abuko Nature Reserve, the Gambia. *Herpetological Bulletin* (77):5-1.
- Barnett, L. K. and Emms, C. 2005. *Common reptiles of The Gambia*. Rare Repro, Hailsham, East Sussex, UK:24 pp.
- Bates, M. F., Branch, W. R., Bauer, A. M., Burger, M., Marais, J., Alexander, G. J. and de Villiers, M. S. (eds.) 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland. Suricata 1*. South African National Biodiversity Institute, Pretoria, South Africa:512 pp.
- Bayliss, J., Timberlake, J., Branch, W. R., Bruessow, C., Collins, S., Congdon, C., Curran, M., De Sousa, C., Dowsett, R., Dowsett-Lemaire, F., Fishpool, L., Harris, T., Herrmann, E., Georgiadis, S., Kopp, M., Liggitt, B., Monadjem, A. and Patel, H., R 2014. The discovery, biodiversity and conservation of Mabu forest: The largest medium-altitude rainforest in southern Africa. *Oryx* 48:177-185.
- Behangana, M., Magala, R., Katumba, R., Ochanda, D., Kigoolo, S., Mutebi, S., Dendi, D., Luiselli, L. and Hughes, D. F. 2020. Herpetofaunal diversity and community structure in the Murchison Falls-Albert Delta Ramsar site, Uganda: Herpetofaunal diversity. *European Journal of Ecology*, 6(2):1-17.
- BBC World 2021. Catholic Church child sexual abuse scandal. *BBC World Report* 5 Oct 2021, online at: <https://www.bbc.com/news/world-44209971>
- Beolens, B., Watkins, M. and Grayson, M. 2011. *The Eponym Dictionary of Reptiles*. Johns Hopkins University Press, Baltimore, USA:xvi+296 pp.
- Berry, P. S. M. 1970. A Note on Shreve's Tree Snake *Dipsadoboa shrevei* in Zambia. *Journal of the Herpetological Association of Africa* (6):20-21.
- Bittencourt-Silva, G. B. 2019. Herpetological survey of western Zambia. *Amphibian and Reptile Conservation* 13(2):1-28.
- Böhme, W., Rödel, M., Brede, C. and Wagner, P. 2011. The reptiles (Testudines, Squamata, Crocodylia) of the forested southeast of the Republic Guinea (Guinée forestière), with a country-wide checklist. *Bonn zoological Bulletin* 60(1):35-61.

- Boulenger, G. A. 1896. *Catalogue of the snakes in the British Museum, Vol. 3*. Taylor and Francis, London, UK:xiv+727 pp.
- Boulenger, G. A. 1897a. A list of reptiles and batrachians from the Congo Free State, with the description of two new snakes. *Annals And Magazine of Natural History* (6)19:276-281.
- Boulenger, G. A. 1897b. Description of a new snake from Usambara, German East Africa. *Annals And Magazine of Natural History* (6)19:281.
- Boulenger, G. A. 1901. Matériaux pour la faune du Congo. Batraciens et reptiles nouveaux. *Ann. Mus. Congo Belge, Zool.* (sect. C. ser. 1) 2:7-14.
- Boulenger, G. A. 1906. Additions to the herpetology of British East Africa. *Proceedings of the Zoological Society of London* 2:570-573.
- Boulenger, G. A. 1907. Descriptions of three new snakes discovered by Mr. G. L. Bates in south Cameroon. *Annals And Magazine of Natural History* (7)19:324.
- Bowcott, O. and Sherwood, H. 2020. Child sexual abuse in Catholic church 'swept under the carpet', inquiry finds. *The Guardian* 11 November online at: <https://www.theguardian.com/world/2020/nov/10/child-sexual-abuse-in-catholic-church-swept-under-the-carpet-inquiry-finds>
- Boycott, R. C. 1992. *An Annotated Checklist of the Amphibians and Reptiles of Swaziland*. The Conservation Trust of Swaziland (online at: <http://eswatiniaturereserves.com/checklist/sdreptam.html>).
- Branch, W. R. 1993. *A Photographic Guide to Snakes and Other Reptiles of Southern Africa*. Struik Publishers, Cape Town, South Africa:144 S.
- Branch, W. R., Bayliss, J., Bitterncourt-Silva, G. B., Conradie, W., Engelbrecht, H. M., Loader, S. P., Menegon, M., Nanvonamuquitxo, C. and Tolley, K. A. 2019. A new species of tree snake (*Dipsadoboa*, Serpentes: Colubridae) from 'sky island' forests in northern Mozambique, with notes on other members of the *Dipsadoboa wernerii* group. *Zootaxa* (PRIN) (Online) 4646(3):541-563.
- Branch, W. R., Rödel, M. -O. and Marais, J. 2005. Herpetological survey of the Niassa Game Reserve, northern Mozambique - Part I: Reptiles. *Salamandra* 41(4):195-214.
- Branch, W. R., Pinto, P. V., Baptista, N. and Conradie, W. 2019. The Reptiles of Angola: History, Diversity, Endemism and Hotspots. Chapter 13, being pp. 283-334 in: B. J. Huntley *et al.* (eds.), *Biodiversity of Angola*. Springer Verlag, Germany:549 pp.
- Broadley, D. G. 1958. Occurrence of *Dipsadoboa shrevei* in Northern Rhodesia. *Journal of the Herpetological Association of Rhodesia* 2:5.
- Broadley, D. G. 1959. The herpetology of Southern Rhodesia. Part I: the snakes. *Bulletin of the Museum of Comparative Zoology Harvard* 120(1):1-100.
- Broadley, D. G. 1962. On some reptile collections from the North-Western and North-Eastern Districts of Southern Rhodesia 1958-1961, with descriptions of four new lizards. *Occ. Pap. Nat. Mus. South. Rhodesia* 26(B):787-843.
- Broadley, D. G. 1968. A new species of *Crotaphopeltis* (Serpentes: Colubridae) from Barotseland, Zambia. *Fieldiana Zoology* 51(10):135-139.
- Broadley, D. G. 1991. The Herpetofauna of Northern Mwinilunga District, Northwest Zambia. *Arnoldia Zimbabwe* 9(37):519-538.
- Broadley, D. and Blaylock, R. 2013. *The Snakes of Zimbabwe and Botswana*. Chimaira, Frankfurt, Germany:387 pp.
- Broadley, D. G. and Cotterill, F. P. D. 2004. The reptiles of southeast Katanga, an overlooked 'hot spot'. *African Journal of Herpetology* 53(1):35-61.
- Broadley, D. G. and Howell, K. M. 1991. A check list of the reptiles of Tanzania, with synoptic keys. *Syntarsus* 1:1-70.
- Broadley, D. G. and Stevens, R. A. 1971. A review of *Chamaetortus aulicus* Günther, with the description of a new subspecies from Malawi (Serpentes: Colubridae). *Arnoldia* 11(5):1-11.
- Broadley, D. G., Doria, C. T. and Wigge, J. 2003. *Snakes of Zambia. An Atlas and Field Guide*. Edition Chimaira, Frankfurt, Germany:280 pp.
- Burger, M., Branch, W. R. and Channing, A. 2004. Amphibians and Reptiles of Monts Doudou, Gabon: Species Turnover Along an Elevational Gradient. *California Academy of Sciences Memoir* 28:145-186.
- Carlino, P. and Pauwels, O. S. G. 2015. An Updated Reptile List of Ivindo National Park, the Herpetofaunal Hotspot of Gabon. *Bulletin of the Chicago Herpetological Society* 50(3):25-39.
- Ceraico, L. M. P., Aescht, E., Ah Yong, S. T., Ballerio, A., Bouchard, P., Bourgoin, T., Dmitriev, D., Evenhous, N., Grygier, M. J., Harvey, M. S., Kottelat, M., Kluge, N., Krell, F. T., Kojima, J., Kullander, S. O., Lucinda, P., Lyal, C. H. C., Pyle, R. L., Rheindt, F. E., Scioscia, C. L., Welter-Schultes, F., Whitmore, D., Yanega, D., Zhang, Z. Q., Zhou, H. Z., Pape, T. (being a unanimous voice of the ICZN) 2023. Renaming taxa on ethical grounds threatens nomenclatural stability and scientific communication. *Zoological Journal of the Linnean Society*, 197, 283-286.
- Chabanaud, P. 1916. Énumération des Ophidiens non encore étudiés de l'Afrique occidentale, appartenant aux Collections du Muséum avec le description des espèces et des variétés nouvelles. *Bulletin du Muséum national d'histoire naturelle Paris* 22:362-382.
- Chabanaud, P. 1917. Descriptions de trois espèces nouvelles de Reptiles de l'Afrique. *Bulletin du Muséum national d'histoire naturelle Paris* 23:219-225.
- Chifundera, K. 1990. Snakes of Zaire and their bites. *African Studies Monographs* (Kyoto:Japan) 10(3):137-157.
- Chippaux, J. and Jackson, K. 2019. *Snakes of Central and Western Africa*. Johns Hopkins University Press, USA:448 pp.
- Chirio, L. 2009. Inventaire des reptiles de la région de la Réserve de Biosphère Transfrontalière du W (Niger/Bénin/Burkina Faso: Afrique de l'Ouest). *Bulletin Société herpétologique de France* (132):13-41.
- Chirio, L. and Lebreton, M. 2007. *Atlas des reptiles du Cameroun*. MNHN, IRD, Paris, France:688 pp.
- Chirio, L. and Ineich, I. 2006. Biogeography of the reptiles of the Central African Republic. *African Journ. of Herp.* 55(1):23-59.
- Cogger, H. G. 2014. *Reptiles and Amphibians of Australia* (Seventh edition), CSIRO. Sydney, Australia:1064 pp.
- Conradie, W. and Branch, W. R. 2016. The herpetofauna of the Cubango, Cuito, and lower Cuando river catchments of south-eastern Angola. *Amphibian and Reptile Conservation* 10(2):6-36.
- Conradie, W., Reeves, B., Brown, N. and Venter, J. A. 2016a. Herpetofauna of the Oviston, Commando Drift and Tsolwana nature reserves in the arid interior of the Eastern Cape Province, South Africa. *Indagao* 32:81-98.
- Conradie, W., Bittencourt-Silva, G. B., Engelbrecht, H. M., Loader, S. P., Menegon, M., Nanvonamuquitxo, C., Scott, M. and Tolley, K. A. 2016b. Exploration into the hidden world of Mozambique's sky island forests: new discoveries of reptiles and amphibians. *Zoosystematics and Evolution* 92(2):163-180.
- Conradie, W., Baptista, N. D., Verburgt, L., Keates, C., Harvey, J., Julio, T. and Neef, G. 2021. Contributions to the herpetofauna of the Angolan Okavango-Cuando-Zambezi river drainages. Part 1: Serpentes (snakes). *Amphibian and Reptile Conservation* 15(2):244-278.
- Cotton, T. 2014. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see BZN 70: 234-237, 71: 30-38; 133-135). *Bulletin of Zoological Nomenclature* 71(3):181-182.
- de Witte (see for Witte)
- Dubois, A., Bauer, A. M., Ceriaco, L. M. P., Dusouler, F., Fretey, T., Lobl, I., Lorvelec, O., Ohler, A., Stopiglia, R. and Aescht, E. 2019. The Linz ZooCode project: a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. First report of activities (2014-2019). *Bionomina*, 17:1-111.
- Duméril, A. M. C., Bibron, G. and Duméril, A. H. A., 1854. *Erpétologie générale ou histoire naturelle complète des reptiles. Tome septième. Deuxième partie, comprenant l'histoire des serpents venimeux*. Librairie Encyclopédique de Roret, Paris, France:i-xii+781-1536.
- Eniang, E. A., Akani, G. C., Rugiero, L., Vignoli, L. and Luiselli, L. 2013. Ecological data of Nigerian *Crotaphopeltis hotamboeia* (Colubridae) populations. *The Herpetological Journal* 23(1):5-9.
- Engelbrecht, H. M. 2017. The radiation and biogeography of snakes across south-eastern Africa with respect to the evolution of the

- savanna biome. PhD thesis, Stellenbosch University, South Africa.
- Engelbrecht, H. M., Branch, W. R., Greenbaum, E., Burger, M., Conradie, W. and Tolley, K. A. 2020. African Herald snakes, *Crotaphopeltis*, show population structure for a widespread generalist but deep genetic divergence for forest specialists. *Journal of Zoological Systematics and Evolutionary Research* 2020:00:1-14 (Online).
- Engelbrecht, H. M., Branch, W. R. and Tolley, K. A. 2021. Snakes on an African plain: the radiation of *Crotaphopeltis* and *Philothamnus* into open habitat (Serpentes: Colubridae). *PeerJ* 9:e11728 (PRINO) (Online):18 pp.
- Ernst, R., Lautenschläger, T., Branquima, M. F. and Hölting, M. 2020. At the edge of extinction: a first herpetological assessment of the proposed Serra do Pingano Rainforest National Park in Uíge Province, northern Angola. *Zoosystematics and Evolution* 96(1):237-262.
- Finke, F. and Liepack, D. 2021. Erstnachweis der Torniers Katzennatter *Crotaphopeltis tornieri* (Werner, 1908) in Kenia. *Sauria* 43(2):67-70.
- Fitzinger, L. 1843. *Systema Reptilium. Fasciculus primus: Amblyglossae*. Vindobonae: Braumüller und Seidel, Germany:106 pp.
- Gans, C., Laurent, R. F. and Pandit, H. 1965. Notes on a herpetological collection from the Somali Republic. *Ann. Mus. Roy. Afr. Centr., Sér. 8vo, Tervuren*, (80) Zool. (134):1-93.
- Gemel, R., Gassner, G. and Schweiger, S. 2019. Katalog der Typen der Herpetologischen Sammlung des Naturhistorischen Museums Wien - 2018. *Annalen des Naturhistorischen Museums in Wien B* 121:33-248.
- Gray, J. E. 1858. Description of a new genus of Boidae from Old Calabar and a list of West African Reptiles. *Proceedings of the Zoological Society of London* 1858:154-167.
- Günther, A. 1858. *Catalogue of Colubrine snakes of the British Museum*. London, UK:I-XVI,1-281.
- Günther, A. 1864. Report on a collection of reptiles and fishes made by Dr. Kirk in the Zambesi and Nyassa Regions. *Proceedings of the Zoological Society of London* 1864:303-314.
- Günther, A. 1888. Contribution to the knowledge of snakes of tropical Africa. *Annals And Magazine of Natural History* (6)1:322-335.
- Günther, A. 1895. Notice of Reptiles and Batrachians collected in the eastern half of tropical Africa. *Annals And Magazine of Natural History* (6)15:523-529.
- Haagner, G. V. and Branch, W. R. 1995. Life History Notes - *Crotaphopeltis hotamboeia*. *African Herp News* (23):44-44.
- Haagner, G. V., Branch, W. R. and Haagner, A. J. F. 2000. Notes on a collection of reptiles from Zambia and adjacent areas of the Democratic Republic of the Congo. *Annals of the Eastern Cape Museum* 1:1-25.
- Hallermann, J. 1998. Annotated catalogue of the type specimens of the herpetological collection in the Zoological Museum of the University of Hamburg. *Mitt. hamb. zool. Mus. Inst* 95:197-223.
- Hallermann, J. 2007. Zur Geschichte der herpetologischen Sammlung des Zoologischen Museums Hamburgs, mit besonderer Berücksichtigung von Dr. Johann Gustav Fischer (1819 - 1889). *Sekretär* 7(1):20-32.
- Hammer, T. A. and Thiele, K. R. 2021. Proposals to amend Articles 51 and 56 and Division III, to allow the rejection of culturally offensive and inappropriate names. *Taxon* 70(6):1392-1394.
- Harrington, S. M., de Haan, S. M., Shapiro, L. and Ruane, S. 2018. Habits and characteristics of arboreal snakes worldwide: arboreality constrains body size but does not affect lineage diversification. *Biological Journal of the Linnean Society* 125(1):61-71.
- Hawkeswood, T. J. 2021. Time to end taxonomic vandalism by Wolfgang Wuster *et al.*: The Snakeman, Raymond Hoser's publications are validly published and his names available according to the ICZN: Objective investigation finds Hoser's taxonomic works as scientific best practice and in every relevant case identifies valid entities. *Calodema* 860:1-59.
- Herrmann, H. -W. and Branch, W. R. 2013. Fifty years of herpetological research in the Namib Desert and Namibia with an updated and annotated species checklist. *Journal of Arid Environments* 93:94-115.
- Honess, P. E. and Bearder, S. K. 1997. Descriptions of the dwarf galago species of Tanzania. *African Primates* 2:75-79.
- Hoser, R. T. 2007a. Wells and Wellington - It's time to bury the hatchet. *Calodema Supplementary Paper* 1:1-9.
- Hoser, R. T. 2007b. Call to outlaw the use of Tongs for catching and handling deadly snakes. *Bulletin of the Chicago Herpetological Society* 42(6):92-95.
- Hoser, R. T. 2009. Creationism and contrived science: A review of recent python systematics papers and the resolution of issues of taxonomy and nomenclature. *Australasian Journal of Herpetology* 2:1-34. (3 February).
- Hoser, R. T. 2012a. Exposing a fraud! *Afronaja* Wallach, Wüster and Broadley 2009, is a junior synonym of *Spracklandus* Hoser 2009! *Australasian Journal of Herpetology* 9 (3 April 2012):1-64.
- Hoser, R. T. 2012b. Robust taxonomy and nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.
- Hoser, R. T. 2013. The science of herpetology is built on evidence, ethics, quality publications and strict compliance with the rules of nomenclature. *Australasian Journal of Herpetology* 18:2-79.
- Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.
- Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.
- Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-64.
- Hoser, R. T. 2015d. PRINO (Peer reviewed in name only) journals: When quality control in scientific publications fails. *Australasian Journal of Herpetology* 26:3-64.
- Hoser, R. T. 2015e. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.
- Hoser, R. T. 2015f. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). *Australasian Journal of Herpetology* 27:37-54.
- Hoser, R. T. 2019a. 11 new species, 4 new subspecies and a subgenus of Australian Dragon Lizard in the genus *Tympanocryptis* Peters, 1863, with a warning on the conservation status and long-term survival prospects of some newly named taxa. *Australasian Journal of Herpetology* 39:23-52.
- Hoser, R. T. 2019b. Richard Shine *et al.* (1987), Hinrich Kaiser *et al.* (2013), Jane Melville *et al.* (2018 and 2019): Australian Agamids and how rule breakers, liars, thieves, taxonomic vandals and law breaking copyright infringers are causing reptile species to become extinct. *Australasian Journal of Herpetology* 39:53-63.
- Hughes, B. 2013. Snakes of Bénin, West Africa. *Bull. Société herpétologique de France* 144:101-159.
- Hughes, B. 2018. The Snakes of Dodoma. *African Herp News* (67):8.
- International Commission of Zoological Nomenclature (ICZN) 1991. Decision of the commission. Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 48(4):337-338.
- International Commission of Zoological Nomenclature (ICZN) 2001. Opinion 1970. *Bulletin of Zoological Nomenclature* 58(1):74, (30 March 2001).
- International Commission of Zoological Nomenclature (ICZN) 2012. Amendment of Articles 8, 9, 10, 21 and 78 of the *International*

Code of Zoological Nomenclature to expand and refine methods of publication. *Zootaxa* (PRINO) (Online) 3450:1-7.

International Commission of Zoological Nomenclature (ICZN) 2021. Opinion 2468 (Case 3601) - *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and *Australasian Journal of Herpetology* issues 1-24: confirmation of availability declined; Appendix A (Code of Ethics): not adopted as a

formal criterion for ruling on Cases. *Bulletin of Zoological Nomenclature* 78 (30 April 2021):42-45.

Jackson, K., Zassi-Boulou, A., Mavoungou, L. and Pangou, S. 2007. Amphibians and Reptiles of the LacTélé Community Reserve, Likouala Region, Republic of Congo (Brazzaville). *Herpetological Conservation and Biology* (2):75-86.

Jacobsen, N. H. G. 2009. A contribution to the herpetofauna of the Passendro Area, Central African Republic. *African Herp News* (47):2-20.

Jacobsen, N. H. G., Pietersen, E. W. and Pietersen, D. W. 2010. A preliminary herpetological survey of the Vilanculos Coastal Wildlife Sanctuary on the San Sebastian Peninsula, Vilankulo, Mozambique. *Herpetology Notes* 3:181-193.

Joger, U. 1982. Zur Herpetofaunistik Kameruns (II). *Bonner Zoologische Beiträge* 33(2-4):313-319.

Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.

Kaiser, H. 2012b. Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.

Kaiser, H. 2013. The Taxon Filter, a novel mechanism designed to facilitate the relationship between taxonomy and nomenclature, vis-à-vis the utility of the Code's Article 81 (the Commission's plenary power). *Bulletin of Zoological Nomenclature* 70(4) December 2013:293-302.

Kaiser, H. 2014a. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature*, 71(1):30-35.

Kaiser, H. 2014b. Best Practices in Herpetological Taxonomy: Errata and Addenda. *Herpetological Review*, 45(2):257-268.

Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.

Keogh, J. S., Branch, W. R. and Shine, R. 2000. Feeding ecology, reproduction and sexual dimorphism in the colubrid snake *Crotaphopeltis hotamboeia* in southern Africa. *African Journal of Herpetology* 49:129-137.

Köhler, J. and Güsten, R. 2007. Herpetological type specimens in the natural history collections of the museums in Darmstadt and Wiesbaden, Germany. *Spixiana* 30(2):275-288.

Lanza, B. 1983. A list of the Somali amphibians and reptiles. *Monitore Zoologico Italiano*, new Ser., Suppl. 18(8):193-247.

Lanza, B. 1990. Amphibians and reptiles of the Somali Democratic Republic: check list and biogeography. *Biogeographia* 14:407-465 [1988].

Largen, M. J. and Rasmussen, J. B. 1993. Catalogue of the snakes of Ethiopia (Reptilia Serpentes), including identification keys. *Tropical Zoology* 6:313-434.

Largen, M. J. and Spawls, S. 2010. *Amphibians and Reptiles of Ethiopia and Eritrea*. Edition Chimaira, Frankfurt, Germany:694 pp.

Lauer, C. and Hoyer, M. 2019. Almost 1,700 priests and clergy accused of sex abuse are unsupervised. *NBC News* 5 October, online at: <https://www.nbcnews.com/news/religion/nearly-1-700-priests-clergy-accused-sex-abuse-are-unsupervised-n1062396>

Laurent, R. F. 1956. Contribution à l'herpétologie de la région des Grandes Lacs de l'Afrique centrale. *Ann. Mus. Roy. Congo Belge* (Sci. Zool.), 48:1-390.

Laurenti, J. N. 1768. *Specimen medicum, exhibens synopsis reptilium emendatam cum experimentis circa venena et antidota reptilium austracorum, quod auctoritate et consensu*. Vienna, Joan. Thomae:217 pp.

Leaché, A. D., Rödel, M., Linkem, C. W., Diaz, R. E., Hillers, A. and Fujita, M. K. 2006. Biodiversity in a forest island: reptiles and amphibians of the Togo Hills, Kyabobo National Park, Ghana. *Amphibian and Reptile Conservation* 4(1):22-45.

Lebreton, M. 1999. *A working checklist of the herpetofauna of Cameroon*. Netherlands Committee for IUCN:160 pp.

Lillywhite, H. B. 2014. *How Snakes Work: Structure, Function and Behavior of the World's Snakes*. Oxford University Press, New York, USA:256 pp.

Lindholm, W. A. 1905. Beschreibung einer neuen Schlangenart (*Dipsadophidium weiler* g. et sp. n.). *Jahrbücher des Nassauischen Vereins für Naturkunde* Ver. LVIII:183-187.

Loveridge, A. 1929. East African reptiles and amphibians in the United States National Museum. *Bulletin of the United States National Museum* (151):1-135.

Loveridge, A. 1932. New opisthoglyphous snakes of the genera *Crotaphopeltis* and *Trimerorhinus* from Angola and Kenya Colony. *Proceedings of the Biological Society of Washington* 45:83-86.

Loveridge, A. 1936. African reptiles and amphibians in the Field Museum of Natural History. *Zool. Ser. Field Mus. Nat. Hist.*, Chicago, 22(1):1-122.

Loveridge, A. 1938a. On a collection of reptiles and amphibians from Liberia. *Proc. New England Zool. Club* 17:49-74.

Loveridge, A. 1938b. Zoological results of the George Vanderbilt African expedition of 1934. VII. Reptiles and amphibians. *Proceedings of the Academy of Natural Sciences of Philadelphia* 89 [1937]:265-296.

Loveridge, A. 1941. Report on the Smithsonian-Firestone Expedition's collection of reptiles and amphibians from Liberia. *Proceedings of the United States National Museum* 91(3128):113-140.

Loveridge, A. 1956. On snakes collected in the Anglo-Egyptian Sudan by J.S. Owen, Esq. *Sudan Notes Rec.* 36 [1955]:37-56.

Loveridge, A. 1957. On a third collection of reptiles taken in Tanganyika by C. J. P. Ionides, Esq. *Tanganyika Notes and Records* 43:1-19.

Lyakurwa, J. V. 2017. The Reptiles of the Uzungwa Scarp Forest Reserve (USFR): An Updated Checklist with Notes on Dagger-Tooth Vine Snake *Xyelodontophis uluguruensis*. *Journal of East African Natural History* 106(2):57-65.

Lyakurwa, J. V., Howell, K. M., Munishi, L. K. and Treydte, A. C. 2019. Uzungwa Scarp Nature Forest Reserve; a unique hotspot for reptiles in Tanzania. *Acta Herpetologica* 14(1):3-14.

Malonza, P. K., Wasonga, V. D., Muchai, V., Rotich, D., Bwong, B. A. and Bauer, A. M. 2006. Diversity and biogeography of herpetofauna of the Tana River Primate National Reserve, Kenya. *Journal of East African Natural History* 95(2):95-109.

Malonza, P. K., Mulwa, D. M., Nyamache, J. O. and Jones, G. 2017. Biogeography of the Shimba Hills ecosystem herpetofauna in Kenya. *Zoological Research* 38(5):1-11.

Marques, M. P., Ceriaco, L. M. P., Blackburn, D. C. and Bauer, A. M. 2018. Diversity and Distribution of the Amphibians and Terrestrial Reptiles of Angola - Atlas of Historical and Bibliographic Records (1840-2017). *Proceedings of the California Academy of Sciences* (Ser. 4) 65:1-501 (Supplement II).

Masters, J. C., Fabien G. S., Couette, C. P., Groves, S. D., Nash, M. D. and Pozzi, L. 2017. A new genus for the eastern dwarf galagos (Primates: Galagidae). *Zoological Journal of the Linnean Society*, 181:229-241.

Matschie, P. 1893. Einige anscheinend neue Reptilien und Amphibien aus West-Afrika. *Sitzungsber. Gesell. naturf. Freunde Berlin* 6:170-175.

Mehrtens, J. M. 1987. *Living snakes of the world in color*. Sterling Publishing Co., New York, NY, USA:480 pp.

Menegon, M., Doggart, N. and Owen, N. 2008. The Nguru mountains of Tanzania, an outstanding hotspot of herpetofaunal diversity. *Acta Herpetologica* 3(2):107-127.

Menegon, M., Loader, S. P., Marsden, S. J., Branch, W. R., Davenport, T. R. B. and Ursenbacher, S. 2014. The genus *Atheris* (Serpentes: Viperidae) in East Africa: Phylogeny and the role of rifting and climate in shaping the current pattern of species diversity.

- Molecular Phylogenetics and Evolution* 79:12-22.
- Menzies, J. I. 1966. The snakes of Sierra Leone. *Copeia* 1966(2):169-179.
- Mitchell, F. J. 1948. A revision of the lacertilian genus *Tympanocryptis*. *Records of the South Australian Museum* 9:57-86.
- Monard, A. 1931. Mission scientifique Suisse dans l'Angola. Résultats scientifiques. Reptiles. *Bull. Soc. Neuchâtel Sci. Nat.*, 33:89-111.
- Monard, A. 1940. Résultats de la mission du Dr. Monard en Guinée Portugaise 1937-1938. *Arq. Mus. Bocage*, Lisbon 11:147-182.
- Monasterio, C. 2016. The herpetofauna of the Dindéfelo Natural Community Reserve, Senegal. *Herpetology Notes* 9:1-6.
- Mosyakin, S. L. 2022. If "Rhodes-" must fall, who shall fall next? *Taxon* 71:49-255.
- Muchai, V. and Malonza, P. 2011. The reptiles and amphibians of Kibwezi Forest, Ngulia and Chyulu Hills. *Kenya Past and Present* (39):45-49.
- Müller, L. 1910. Beiträge zur Herpetologie Kameruns. *Abh. Bayer. K. Akad. Wiss.* 2, 24(3):545-626.
- Pauwels, O. S. G. and Colyn, M. 2023. On a Diverse Collection of Snakes from Amadjabe, Left Bank of the Congo River, Northeastern Democratic Republic of the Congo. *Bulletin of the Chicago Herpetological Society* 58(3):34-47.
- Pauwels, O. S. G. and David, P. 2008. *Miscellanea Herpetologica Gabonica II*. *Hamadryad* 32(1):19-24.
- Pauwels, O. S. G. and Vande Weghe, J. P. 2008. *Les reptiles du Gabon*. Smithsonian Institution, Washington:272 pp.
- Pauwels, O. S. G., Kamdem Toham, A. and Chimsunchart, C. 2002. Recherches sur l'herpétofaune du Massif du Chaillu, Gabon. *Bull. Inst. Roy. Sci. Nat. Belgique (Biologie)* 72:47-57.
- Pauwels, O. S. G., Branch, W. R. and Burger, M. 2004. Reptiles of Loango National Park, Ogooue-Maritime Province, South-Western Gabon. *Hamadryad* 29(1):115-127.
- Pauwels, O. S. G., Christy, P. and Honorez, A. 2006. Reptiles and National Parks in Gabon, Western Central Africa. *Hamadryad* 30(1-2):181-196.
- Pauwels, O. S. G., Le Garff, G. B., Ineich, I., Carlino, P., Melcore, I., Boundenga, L., Vigna, C., Stévant, T., Jeffery, K., Orbell, C., Squarcini, J. -B., Vande weghe, J. P. and White, L. J. T. 2016. *Miscellanea Herpetologica Gabonica V and VI*. *Bulletin of the Chicago Herpetological Society* 51:177.
- Pauwels, O. S. G., Morelle, S., Albert, J. -L., Carlino, P., Rahola, N. and Trape, J. -F. 2019. New reptile records from Lékédi Park and Haut-Ogooué Province, southeastern Gabon. *Amphibian and Reptile Conservation* 13(1):143-161.
- Pauwels, O. S. G., Chirio, L. and Dekoninck, W. 2022. Diet records for snakes from Guinea, West Africa. *Bulletin of the Chicago Herpetological Society* 57(6): 117-123.
- Peters, W. C. H. 1863. Eine Übersicht der von Hrn. Richard Schomburgk an das zoologische Museum eingesandten Amphibien, aus Buchsfelde bei Adelaide in Südastralien. *Monatsber. königl. Akad. Wiss. Berlin*. 1863 (April):228-236.
- Peters, W. C. H. 1869. Über neue Gattungen und neue oder weniger bekannte Arten von Amphibien (*Eremias*, *Dicrodon*, *Euprepes*, *Lygosoma*, *Typhlops*, *Eryx*, *Rhynchonyx*, *Elapomorphus*, *Achalinus*, *Coronella*, *Dromicus*, *Xenopholis*, *Anoplodipsas*, *Spilotes*, *Tropidonotus*). *Monatsber. k. preuss. Akad. Wiss. Berlin*, 1869:432-447.
- Pietersen, D., Verburgt, L. and Davies, J. 2021. *Snakes and other reptiles of Zambia and Malawi*. Struik Nature / Penguin / Random House, South Africa:376 pp.
- Pitman, C. R. S. 1974. *A guide to the snakes of Uganda*. Codicote, Wheldon and Wesley, L., UK:290 pp.
- Pyron, R. A., Burbrink, F. T. and Weins, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evol. Biol.* 13, 93. Published online at: <http://www.biomedcentral.com/1471-2148/13/93>.
- Rasmussen, J. B. 1981. The snakes from the rainforest of the Usambara Mountains, Tanzania: a checklist and key. *Salamandra* 17(3-4):173-188.
- Rasmussen, J. B. 1985. A new species of *Crotaphopeltis* from east Africa, with remarks on the identity of *Dipsas hippocrepis* Reinhardt, 1843 (Serpentes: Boiginae). *Steenstrupia* 11(4):113-129.
- Rasmussen, J. B. 1986. On the taxonomic status of *Dipsadoboa werneri* (Boulenger), *D. shrevei* (Loveridge), and *Crotaphopeltis hotamboiea kageleri* Uthmüller (Boiginae, Serpentes). *Amphibia-Reptilia* 7:51-73.
- Rasmussen, J. B. 1989a. A taxonomic review of the *Dipsadoboa duchesnei* complex. *Bonner Zoologische Beiträge* 40(3/4):249-264.
- Rasmussen, J. B. 1989b. On the taxonomic status of *Dipsadoboa aulica aulica* Günther and *D. aulica flavida* Broadley and Stevens, with the description of a new subspecies of *D. flavida* Broadley and Stevens (Boiginae, Serpentes). *Amphibia-Reptilia* 10:35-62.
- Rasmussen, J. B. 1993a. The current taxonomic status of Tornier's cat-snake (*Crotaphopeltis tornieri*). *Amphibia-Reptilia* 14:395-409.
- Rasmussen, J. B. 1993b. A taxonomic review of the *Dipsadoboa unicolor* complex, including a phylogenetic analysis of the genus (Serpentes, Dipsadidae, Boiginae). *Steenstrupia* 19(4):129-196.
- Rasmussen, J. B. 1997. On two little-known African water snakes (*Crotaphopeltis degeni* and *Crotaphopeltis barotseensis*). *Amphibia-Reptilia* 18:191-206.
- Rasmussen, J. B. and Hughes, B. 1996. Description of some new snake species. I. (English translation of the original Danish text of T. Reinhardt 1843). *Steenstrupia* 22:13-39.
- Rasmussen, J. B., Chirio, L. and Ineich, I. 2000. The Herald Snakes (*Crotaphopeltis*) of the Central African Republic, Including a Systematic Review of *C. hippocrepis*. *Zoosystema* 22(3):585-600.
- Razzetti, E. and Msuya, C. A. 2002. *Field guide to the amphibians and reptiles of Arusha National Park (Tanzania)*. Publ. Ed. Negri Istituto, Oikos, Varese:84 pp.
- Reinhardt, J. T. 1843. Beskrivelse af nogle nye Slangearter. *Danske Vidensk. Selsk. Afhandl.* 10:233-279.
- Rhodin, A. et al. (70 listed authors, with some later publishing that they had never read the document they allegedly co-authored) 2015. Comment on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; 71: 30-38, 133-135, 181-182, 252-253). *Bulletin of Zoological Nomenclature* 72(1):65-78.
- Ride, W. D. L. (ed.) et al. (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature*. The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").
- Robertson, I. A. D., Chapman, B. M. and Chapman, N. F. 1963. Notes on some reptiles collected in the Rukwa Valley, S. W. Tanganyika. *Annals And Magazine of Natural History Ser.* 13, 5(55):421-432.
- Roman, B. 1974. Deux espèces du genre *Crotaphopeltis* (Colubridés Ophistoglyphes) dans le territoire de Haute-Volta: *Crotaphopeltis hotamboiea* (Laurent) et *Crotaphopeltis acarina* n. sp. *Notes et documents Voltaïques* 8(1):13 pp.
- Rovero, F., Menegon, M., Fjeldså, J., Collett, L., Doggart, N., Leonard, C., Norton, G., Owen, N., Perkin, A., Spitale, D., Ahrends, A. and Burgess, N. D. 2014. Targeted vertebrate surveys enhance the faunal importance and improve explanatory models within the Eastern Arc Mountains of Kenya and Tanzania. *Diversity and Distributions* 20(12):1438-1449.
- Sanchez-Vialas, I., Calvo-Revuelta, M. and De La Riva, I. 2022. Synopsis of the terrestrial Reptiles of Equatorial Guinea. *Zootaxa* (PRINO) (Online) 5202(1):1-197.
- Schlüter, A. and Hallermann, J. 1997. The Type Specimens in the Herpetological Collection of the Staatliches Museum für Naturkunde in Stuttgart. *Stuttgarter Beitr. Naturk.* Ser. A (553):1-15.
- Schmidt, K. P. 1923. Contributions to the herpetology of the Belgian Congo based on the collection of the American Museum Congo Expedition, 1909-1915. Part II. Snakes, with field notes by Herbert Lang and James P. Chapin. *Bulletin of the American Museum of Natural History* 49(1):1-146.
- Scortecci, G. 1929. Primo contributo alla conoscenza dei Rettili e degli Anfibi della Somalia italiana. *Atti Soc. ital. Sci. nat.* 68:245-279.

- Scortecchi, G. 1931. Contributo alla conoscenza dei rettili e degli anfibi della Somalia, dell'Eritrea e dell'Abissinia. *Boll. Mus. Zool. Univ. Torino*, (ser. 3) 41(10) [1930]:1-26.
- Seba, A. 1734. *Locupletissimi Rerum naturalium Thesauri accurata Descriptio, et Iconibus artificiosissimis Expressio, per universam Physices Historiam. Opus, cui in hoc Rerum Genere, nullum par exstitit. Vol. 1.* Janssonio-Waesbergios, Amsterdam, The Netherlands:178 pp.
- Segniabeto, G., Lazcano, H., Trape, J. F., David, P., Ohler, A., Dubois, A. and Glitho I. A. 2011. The snake fauna of Togo: systematics, distribution and biogeography, with remarks on selected taxonomic problems. *Zoosystema* 33(3):325-360.
- Segniabeto, G. H., Dekawole, J. K., Ketoh, G. K., Dendi, D. and Luiselli, L. 2022. Herpetofaunal Diversity in a Dahomey Gap Savannah of Togo (West Africa): Effects of Seasons on the Populations of Amphibians and Reptiles. *Diversity* 14:964:15 pp.
- Senter, P. J. and Chippaux, J. P. 2022. Biogeography of snakes in Liberia: Review and synthesis of current knowledge. *Ghana Journal of Science* 63(1):29-62.
- Smith, A. 1849. *Illustrations of the Zoology of South Africa. 3 (Reptiles)*. Smith, Elder, and Co., London, UK.
- Spawls, S., Howell, K., Hinkel, H. and Menegon, M. 2011. *Field Guide to East African Reptiles*. Bloomsbury, UK:543 pp.
- Spawls, S., Howell, K., Hinkel, H. and Menegon, M. 2018. *Field Guide to East African Reptiles*. Bloomsbury, UK:624 pp.
- Sternfeld, R. 1908. Die Schlangenfauna von Kamerun. *Mitt. zool. Mus. Berlin* 3(4):397-432.
- Sternfeld, R. 1917. Reptilia und Amphibia. in: Schubotz, H. (Hrsg.): Wissenschaftliche Ergebnisse der Zweiten Deutschen Zentral-Afrika-Expedition, 1910-1911 unter Führung Adolph Friedrichs, Herzog zu Mecklenburg. Leipzig: Klinkhardt und Biermann, [Band] 1, *Zoologie, Lieferung* 11:407-510.
- Tarn, N., Tobi, E., Dixon-MacCallum, G. P. and Bamba-Kaya, A. 2018. Geographic Distribution: *Dipsadoboa viridis*. *Herpetological Review* 49(1):76.
- Thiele, K. R., Oliver, P. M., Bauer, A. M., Doughty, P., Kraus, F., Rix, M. G., Kaiser, H. 2020. Case 3824 - A special proposal to suppress certain names under the plenary powers of the Commission. *Bulletin of Zoological Nomenclature* 77:78 (title only). The full submission to the ICZN was sent out as a SPAM email to thousands of recipients, is a rambling 71 page pdf and is widely available online.
- Timberlake, J. R., Bayliss, J., Dowsett-Lemaire, F., Conghan, C., Branch, W. R., Collins, S., Curran, M., Dowsett, R. J., Fishpool, L., Francisco, J., Harris, T., Kopp M. and De Sousa, C. 2012. *Mt Mabu, Mozambique: Biodiversity and Conservation*. Report produced under the Darwin Initiative Award 15/036. Royal Botanic Gardens, Kew, London, UK:94 pp
- Tolley, K. A., Telford, N. S., Makhubo, B. G., Power, R. J. and Alexander, G. J. 2023. Filling the gap: Noteworthy herpetological discoveries in North West Province, South Africa. *Zoosystematics and Evolution* 99(1):101-116.
- Trape, J. -F. and Balde, C. 2014. A checklist of the snake fauna of Guinea, with taxonomic changes in the genera *Philothamnus* and *Dipsadoboa* (Colubridae) and a comparison with the snake fauna of some other West African countries. *Zootaxa* (PRINO) (Online) 3900(3):301-338.
- Trape, J. -F. and Collet, M. 2021. Nouvelles données sur les serpents du sud-est du Katanga. *Bull. Société herpétologique de France* 179:11-26.
- Trape, J. -F. and Mané, Y. 2000. Les serpents des environs de Dielmo (Sine-Saloum, Sénégal). *Bull. Société herpétologique de France* 95:19-35.
- Trape, J. -F. and Mané, Y. 2004. Les serpents des environs de Bandafassi (Sénégal oriental). *Bull. Société herpétologique de France* 109:5-34.
- Trape, J. -F. and Mané, Y. 2006. *Guide des serpents d'Afrique occidentale. Savane et désert*. [Senegal, Gambia, Mauritanie, Mali, Burkina Faso, Niger]. IRD Editions, Paris, France:226 pp.
- Trape, J. -F. and Mané, Y. 2015. The snakes of Niger. *Amphibian and Reptile Conservation* 9(2):39-55 (e110) (online).
- Trape, J. -F. and Mané, Y. 2017. The snakes of Mali. *Bonn Zoological Bulletin* 66(2):107-133.
- Trape, J. -F. and Roux-Esteve, R. 1995. Les serpents du Congo: liste commentée et clé de détermination. *Journal of African Zoology* 109(1):31-50.
- Trape, J. -F., Crochet, P. -A., Broadley, D. G., Sourouille, P., Mané, Y., Böhme, W., Saleh, M., Karan, A., Lanza, B. and Mediannikov, O. 2019. On the *Psammophis sibilans* group (Serpentes, Lamprophiidae, Psammophiinae) north of 12°S, with the description of a new species from West Africa. *Bonn zoological Bulletin* 68(1):61-91.
- Trape, J. -F., Kodindo, I. D., Djiddi, A. S., Mad-Toingué, J. and Kerah, C. H. 2020. The snakes of Chad: results of a field survey and annotated country-wide checklist. *Bonn Zoological Bulletin* 69(2):367-393.
- Ullrich, K., Grell, O. and Böhme, W. 2010. Reptiles from southern Benin, West Africa, with the description of a new *Hemidactylus* (Gekkonidae), and a country-wide checklist. *Bonn Zoological Bulletin* 57(1):31-54.
- Uthmüller, W. 1939. Über eine neue Rasse von *Crotaphopeltis hotamboiea*. *Zoologischer Anzeiger* 125:108-112.
- Wallach, V., Williams, K. L. and Boundy, J. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. Taylor and Francis, CRC Press, USA/UK:1237 pp.
- Wellington, R. W. 2015. Comment on the proposed confirmation of the availability of the generic name *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature* 72(3):222-226.
- Werner, F. 1897. Über Reptilien und Batrachier aus Togoland, Kamerun und Tunis aus dem Kgl. Museum für Naturkunde in Berlin. *Verh. Zool.-Bot. Ges.*, Wien 47:395-407.
- Werner, F. 1899. Ueber Reptilien und Batrachier aus Togoland, Kamerun und Deutsch-Neu-Guinea grösstentheils aus dem k. Museum für Naturkunde in Berlin. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* 49:132-157.
- Werner, F. 1908. Ergebnisse der mit Subvention aus der Erbschaft Treilt unternommenen zoologischen Forschungsreise Dr. Franz Werner's nach dem Ägyptischen Sudan und Norduganda. XII. die Reptilien und Amphibien. *Sitzungsber. Akad. Wiss. Wien* 116 [1907]:1823-1926.
- Werner, F. 1909. Beschreibung neuer Reptilien aus dem Kgl. Naturalienkabinett in Stuttgart. *Jahreshefte Ver. vaterl. Naturk. Württ.* 65:55-63.
- Werner, F. 1913. Neue oder seltene Reptilien und Frösche des Naturhistorischen Museums in Hamburg. Reptilien der Ostafrika-Expedition der Hamburger Geographischen Gesellschaft 1911/12. Leiter: Dr. E. Obst. Reptilien und Amphibien von Formosa. *Jb. Hamb. wiss. Anst.*, 30 [1912], 2. Beiheft: 1-39, 40-45, 45-51.
- Witte, G. F. de 1933. Reptiles récoltés au Congo Belge par le Dr. H. Schouteden et par M. G.-F. Witte. *Ann. Mus. Congo belge Zool. Ser.* 1 Tome III:53-100.
- Zassi-Boulou, A. G., Tchimbakala, J. G., Mavoungou, L. B. and Jackson, K. 2020. A Survey of Snakes in the Patte d'Oie Forest Reserve (Brazzaville, Republic of Congo): an Urban Snake Community in Central Africa. *Herpetological Conservation and Biology*, 15(1):139-149.

CONFLICTS OF INTEREST

None.

Cite this paper as:

Hoser, R. T. 2023. New taxa within the African Snake genus *Dipsadoboa* Günther 1858. *Australasian Journal of Herpetology* 62:23-35.

Six new species of viper within *Atheris* Cope, 1862 *sensu lato* from central Africa!

LSIDURN:LSID:ZOOBANK.ORG:PUB:E6DE2E9E-DE36-4BD4-A3A8-9FC464FC2D1A

RAYMOND T. HOSER

LSIDurn:lsid:zoobank.org:author:F9D74EB5-CFB5-49A0-8C7C-9F993B8504AE

488 Park Road, Park Orchards, Victoria, 3134, Australia.

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: snakeman (at) snakeman.com.au

Received 11 December 2022, Accepted 9 April 2023, Published 25 May 2023.

ABSTRACT

An ongoing audit of the African herpetofauna has found seven further forms of previously unnamed viper from east Africa within the genus *Atheris* Cope, 1862 *sensu lato*. Five species were within *Atheris* and another in the associated genus *Montatheris* Broadley, 1996, as well as a subspecies within *Atheris*.

All are formally in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) based on consistent morphological divergence and/or allopatric distributions combined with identifiable geographical divergence. Previously published molecular evidence supports this action for some species, while the other newly named forms are separated by biogeographical barriers of significant antiquity (and in the absence of any molecular data), implying species-level divergence.

As all appear to be range-restricted forms in a region of rampant human population growth, the recognition of and conservation of these newly named taxa is critically important.

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 may well become extinct as has already happened for other similarly affected taxa, including as detailed in Hoser (2019a, 2019b).

A new subgenus within *Atheris* comprising two divergent species is also formally named, as is a second monotypic one for another divergent member of the *Atheris* group.

Keywords: Viper; Africa; Kenya; Tanzania; Malawi; *Atheris*; *Woolfvipera*; *Montatheris*; *Adenorhinus*; *Poecilostolus*; *nitschei*; *desaixi*; *hindi*; *mabuensis*; *barbouri*; *matildae*; *rungweensis*; *woosnami*; new subgenus; *Piersonvipera*; *Kenyavipera*; new species; *piersoni*; *cummingae*; *euanedwardsi*; *ernestswilei*; *marleneswileae*; *josephburkei*; new subspecies; *divergans*.

INTRODUCTION

Snakes of the African genus *Atheris* Cope, 1862, were reviewed at the genus-level by Hoser in 2012 (Hoser 2012d). In that paper he divided the genus four ways into subgenera.

He did this using pre-existing and available names for three groups and erected the subgenus *Woolfvipera* Hoser, 2012 for the *Atheris nitschei* Tornier, 1902, species group.

Smid and Tolley (2019) confirmed a divergence of over 10 MYA for that trio of species from others in *Atheris*, thereby effectively supporting, the earlier taxonomic conclusion of Hoser (2012).

It was known that there were a number of unnamed species at the time Hoser (2012d) was published and I, Raymond Hoser deferred naming any on the basis that others claimed to be working on naming some of these.

Atheris matildae Menegon, Davenport and Howell, 2011 was named at the time Hoser (2012d) was being prepared and incorporated into that paper, although a second related unnamed species was not named by the same authors and prior to this paper, remained unnamed.

Following Hoser (2012d), two other species were formally named in 2020, being *Atheris hetfieldi* Ceriaco, Marques and Bauer, 2020 and *Atheris mongoensis* Collett and Trape, 2020.

Being aware of other yet unnamed taxa within the *Atheris* genus, including at least one species which is not known to occur within any formally protected areas, as well as the urgency in formally naming these forms increasing due to ongoing human population growth in the region, I have no hesitation in formally naming these six forms.

In addition one divergent subspecies with a divergence of about

700K years from the nominate form is also formally named.

In terms of these taxa, the only serious consideration was at what level (viz. species or subspecies), each should be formally named. In deciding ultimately to name each (bar one) as species, rather than subspecies, even though there was no molecular data available for four of these taxa, I made the decision based on likely divergences based on morphological differences and antiquity of barriers separating the relevant populations.

Smid and Tolley (2019) also found that *A. mabuensis* Branch and Bayliss, 2009 did not fit within any of the other subgeneric groups as outlined by Hoser (2012d), noting that Hoser (2012d) placed the species within *Adenorhinus* Marx and Rabb, 1965, a placement implied by the results of Smid and Tolley (2019) to be erroneous.

They found *A. mabuensis* diverged from the rest of *Atheris*, including the other species within *Adenorhinus* about 13 MYA.

Following on from that finding and the obvious divergence of *A. mabuensis* from the others, it only made sense to erect a subgenus for the species, which is done within this paper, because no one has seen fit to do so earlier and no alternative name is available.

As putative *A. mabuensis* has been found by myself to consist of two quite distinctive taxa, the type species is the newly named one and not *A. mabuensis*.

That act is intentional as the new subgenus and patronym named species is named in honour of a man, Charles Pierson, of Moss Vale, New South Wales, Australia who has made major life changing sacrifices for and contributions to, wildlife conservation globally, for which he has received relatively little recognition so far.

Another subgenus is formally named as *Kenyavipera subgen. nov.* to accommodate the similarly divergent species *Atheris desaixi* Ashe, 1968, believed to have diverged from all congeners about 12 MYA based on the findings of Smid and Tolley (2019).

Hoser (2012d) had placed that species in the subgenus *Woolfvipera* Hoser, 2012, type species *Atheris nitschei* Tornier, 1902, but the findings of Smid and Tolley (2019) showed this placement to be erroneous, necessitating the erection of a new genus for this divergent, range-restricted taxon.

In terms of the six species named in this paper, only one of them has been in in any way flagged as a new or unnamed species by anyone else, this being a species within *Adenorhinus* Marx and Rabb, 1965, that was identified as *Atheris cf ceratophora* by Menegon *et al.* (2014).

The single subspecies named in this paper has not been flagged as taxonomically distinct previously by anyone.

Again I emphasize the fact that none of those authors, who published Menegon *et al.* (2014), indicated any desire to name the taxon that was identified as *Atheris cf ceratophora*.

MATERIALS AND METHODS

As part of a wider audit of the African viperidae, all species and populations were assessed to see if there were any cryptic or otherwise unnamed species.

Previous papers naming new taxa of African vipers or relevant to the taxonomy and nomenclature of African species of Viperidae by myself, Raymond Hoser include Hoser (2012a, 2012b, 2012c, 2012d, 2013a, 2013c, 2013d, 2015g, 2022).

Naming species within *Atheris sensu lato* was deferred by myself in 2012, when I first identified a number of obviously unnamed forms, pending others naming those or other species, but ultimately only two species were named in the following decade and my earlier audit uncovered about 6 other candidate species.

Two people, Bill Branch of South Africa and Don Broadley sought to monopolize the genus *Atheris sensu-lato* and made unlawful threats against others who had an interest in the genus.

They even had people they saw as rivals raided by government authorities, including heavily armed police with guns, following their malicious complaints to them.

(These are the same Bill Branch and Don Broadley who were notorious for procuring young black boys for anal sex in the same way as done by Clergy (BBC World 2021, Bowcott and Sherwood

2020, Lauer and Hoyer 2019), and evading prosecution because of their senior positions at government-owned public museums). Broadley, a known thief, also engaged in taxonomic vandalism and acts of scientific fraud as detailed by Hoser (2012a).

In any event, Don Broadley died on 10 March 2016, and this was followed by Bill Branch dying on 14 October 2018.

As of 2022, there was no indication of anyone with any intent of naming any potential species within *Atheris sensu lato* and so the decision was made to revisit the group.

Some putative species, including, for example putative *Atheris (Atheris) chloroechis* (Pel, 1851) were found to contain more than one species, but in the main the generally unrecognized forms were found to already have available names.

They were effectively ignored in terms of the writing of this paper.

Although, for the record, I found *A. chloroechis* comprised two species. The type form (type locality of Bute, Ghana), occurs in Ghana and west Togo, mainly in the hills surrounding the lower Volta drainage. The specimens from Monts Nimba, western Ivory Coast and west of there, including within Liberia, Guinea and Sierra Leone are of a divergent species, for which the name *Atheris polylepis* Peters, 1864 is available.

The two taxa are widely allopatric as well.

Taxonomic vandalism as practiced by Kaiser *et al.* (2013) (and later incarnations), that is, the illegal renaming of previously named taxa and then promoting the illegally coined new name, 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 and again in an openly published editorial early 2023 (ICZN 2021, Ceriaco *et al.* 2023).

In terms of this paper, all putative species within *Atheris sensu lato* were investigated, including those within *Montatheris* Broadley, 1996 and *Proatheris* Broadley, 1996 for potentially unidentified and/or unnamed species or subspecies.

Known distributions 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?

Living and dead animals from across the known ranges of each species were investigated and examined, as were quality photos of specimens with known locality data, all with a view to ascertaining any consistent or quantifiable differences between populations, that may warrant taxonomic division.

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 on all of *Atheris sensu lato* and other African species groups known to have diverged because of the same biogeographical history, 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.

However for five putative species in which divergent populations were found, no synonyms existed and these were the six ones identified to be formally named as done in this paper.

Those species were as follows:

1/ A population of putative *Atheris mabuensis* Branch and Bayliss, 2009 from Mount Namuli, the highest peak in the Zambezia Province of Mozambique,

2/ A population of so-called *Atheris cf ceratophora* (subgenus *Adenorhinus* Marx and Rabb, 1965) as identified by Menegon *et al.* (2014), being from Kigogo Forest Reserve in southern Udzungwa, Tanzania,

3/ Putative *A. rungweensis* (subgenus *Woolfvipera* Hoser, 2012) from Mount Mtantwa, Tanzania, and a second population from isolated mountains further north.

4/ Putative *A. squamigera* Hallowell, 1854 (in the subgenus *Poecilostolus* Günther, 1863), from north-east of Lake Victoria,

mainly in Kenya.

5/ *Montatheris hindii* Boulenger, 1910 from Mt. Kirinyaga (AKA Mount Kenya) and area north-east of the main population of *M. hindii*.

Furthermore a subspecies of *Atheris barbouri* Loveridge, 1930 was also identified and is formally named herein.

Specimens of both the type forms and the divergent forms of each putative species and subspecies were closely inspected to see if there were consistent differences warranting separate taxonomic recognition of each form.

Literature relevant to the taxonomic conclusions with respect of the populations of the five or six above-mentioned putative species or species groups, which also included relevant publications about similarly biogeographically constrained taxa (e.g. *Crotaphopeltis* Fitzinger, 1843 *sensu lato* and *Dipsadoboa* Günther 1858 *sensu lato*), included the following: Akeret (2004, 2010), Angel (1925), Ashe (1968), Auerbach (1987), Barbour (1914), Barbour and Amaral (1927a, 1927b), Barbour and Loveridge (1928), Barnett (2001), Barnett and Emms (2005), Bates *et al.* (2014), Bayliss *et al.* (2014), Behangana *et al.* (2020), Beolens *et al.* (2011), Berkheimer (1996), Bittencourt-Silva (2019), Boettger (1887), Bogert (1940), Böhme (1987), Böhme *et al.* (2011), Boulenger (1896, 1897a, 1897b, 1901, 1906a, 1906b, 1907, 1910), Boycott (1992), Branch (1986, 1993), Branch and Bayliss (2009), Branch and Rödel (2003), Branch *et al.* (2005, 2019), Briscoe (1949), Broadley (1960, 1989, 1996, 1998), Broadley and Blaylock (2013), Broadley and Cotterill (2004), Broadley and Howell (1991), Broadley *et al.* (2003), Burger *et al.* (2004), Carlino and Pauwels (2015), Ceriaco *et al.* (2020), Chabanaud (1916, 1917), Chifundera (1990), Chippaux (2006), Chippaux and Jackson (2019), Chirio (2009), Chirio and Lebreton (2007), Chirio and Ineich (2006), Cimatti (2006), Collett and Trape (2020), Conradie *et al.* (2016, 2019, 2021), Capocaccia (1961), Cope (1860, 1862), Dehling and Dehling (2012), Demos *et al.* (2013), de Witte (see for Witte), Dobiey (2007), Dobiey and Vogel (2007), Dowling and Savage (1960), Duméril *et al.* (1854), Dunn (1946), Emmrich (1997), Engelbrecht (2017), Engelbrecht *et al.* (2020, 2021), Ernst and Rödel (2002), Ernst *et al.* (2020), Ferreira (1897), Fischer (1888), Fitzinger (1843), Fleck (2003), Gemel *et al.* (2019), Getreuer (2019), Goldberg *et al.* (2021), Gower *et al.* (2012), Gray (1858), Greenbaum (2017), Groen *et al.* (2009), Günther (1858, 1863a, 1863b, 1864, 1888, 1895, 1896), Gutsche (2014), Haagner *et al.* (2000), Hallermann (1998, 2007), Hallowell (1854), Harrington *et al.* (2018), Herrmann *et al.* (1999), Hirschmann (2008), Hoer (2013), Honess and Bearder (1991), Hörold (2014), Hoser (2012a, 2012b, 2012c, 2012d, 2013a, 2013c, 2013d, 2015g, 2022), Hughes (2013, 2017, 2018), Hughes and Barry (1969), ICZN (1991a, 1991b, 2001, 2021), Ionides and Pitman (1965), Jachan (2010), Jan (1863), Joger (1982), Joger and Courage (1999), Kielgast (2011), Koetze (2008), Kramer (1961), Krecsak (2007), Krecsak and Bohle (2008), Laita (2013), Lanoie and Branch (1991), Largen and Spawls (2010), Laurent (1955, 1956, 1958), Laurenti (1768), Lawson (1999), Lawson and Ustach (2000), Lawson *et al.* (2001), Lebreton (1999), Leaché *et al.* (2006), Lenk *et al.* (2001), Lillywhite (2014), LiVigni (2013), Love (2017), Loveridge (1929, 1930, 1932, 1933, 1936, 1938a, 1938b, 1946, 1957, 1957b), Lyakurwa (2017), Lyakurwa *et al.* (2019), Mallow *et al.* (2003), Malonza *et al.* (2006, 2017), Maritz *et al.* (2016), Marques *et al.* (2018), Marx and Rabb (1965), Marshall and Strine (2014), Masters *et al.* (2017), Mattison (1995, 2007), McDiarmid *et al.* (1999), Meek and Cory (1910), Meidinger (1998, 2000), Menegon *et al.* (2008, 2011, 2014), Menzies (1966), Mertens (1965), Meshack (2009), Milde (2019), Mocquard (1887), Monard (1931, 1940), Monzel (2012), Muchai and Malonza (2011), Müller (1910), Ota and Hikida (1987), Pauwels and Brecko (2020), Pauwels and Colyn (2023), Pauwels and David (2008), Pauwels and Vande Weghe (2008), Pauwels *et al.* (2002, 2016, 2019, 2022), Pel (1852), Penner *et al.* (2013), Perret (1961), Perret and Mertens (1957), Peters (1854, 1863, 1864), Pfeffer (1893), Phelps (2010), Pietersen *et al.* (2021), Pitman (1974), Portik *et al.* (2016), Pyron *et al.* (2013), Rasmussen (1981, 1985, 1986, 1989a, 1989b, 1993a, 1993b, 1997), Rasmussen and Howell (1982, 1999),

Razzetti and Msuya (2002), Reinhardt (1843), Reuss (1939), Ride *et al.* (1999), Robertson *et al.* (2003), Rochebrune (1885), Roelke and Smith (2010), Rovero *et al.* (2014), Sanchez-Vialas *et al.* (2022), Santos *et al.* (2021), Schlegel (1855), Schlüter and Hallermann (1997), Schmidt and Kunz (2005), Schmidt (1923), Segniabeto *et al.* (2011, 2022), Senter and Chippaux (2022), Spawls (1990), Spawls and Branch (1995), Spawls *et al.* (2011, 2018), Spranger (2002), Sternfeld (1908, 1917), Stevens (1973), Sweeney (1963), Timberlake *et al.* (2012), Tornier (1902), Trape and Balde (2014), Trape and Collet (2021), Trape and Mané (2000, 2004, 2006, 2015, 2017), Trape and Roux-Esteve (1995), Ullenbruch and Böhme (2017), Wagner (2018), Wallach *et al.* (2014), Wallach (2019), Werner (1895), Werning and Wolf (2007), Wirth (2011), Witte (1933), Wustrack (2002), Zassi-Boulou *et al.* (2020) and sources cited therein.

RESULTS

In terms of all the seven candidate taxa mentioned above, each were found to be divergent at the species level, bar one, with all being sufficiently morphologically divergent and allopatric, enabling relevant separation at the species or subspecies level.

The molecular evidence of Menegon *et al.* (2014), combined with the physical divergence of *Atheris cf. ceratophora* and one of the two populations of *A. rungweensis*, the one being from Mount Mtantwa was sufficient to warrant these two being regarded as full species.

The other population of putative *A. rungweensis* from further north is affected by the same biogeographical factors causing isolation and is presumably of the same antiquity in terms of divergence and so it too is regarded as a full species.

Putative *Atheris mabuensis* Branch and Bayliss, 2009 from Mount Namuli is only a short distance (about 60-70 km in a straight line) from Mount Mabu (including near slopes), but is separated by wholly unsuitable habitat and so the two populations have been disconnected for some time.

Significantly the divergence between the two forms of the same putative species are such that recognition of the unnamed form as merely a subspecies is not appropriate.

In any event, both populations are not interbreeding and clearly evolving as separate species.

A similar situation exists with *Montatheris hindii* Boulenger, 1910 from Mt. Kirinyaga (AKA Mount Kenya), the population of which is very close to that of the type form from Arberdare Range, with the higher slopes populated by the same putative species potentially just 20 km away.

Once again the morphological divergence of each population warrants full species-level recognition.

Putative *A. squamigera* Hallowell, 1854 (in the subgenus *Poecilostolus* Günther, 1863), from north-east of Lake Victoria, mainly in Kenya is also divergent from the previously named populations in the Democratic Republic of Congo and further west and is apparently allopatric, based on rifting in the intervening valley over the past 2 MYA and based on these factors is also of species-level divergence.

Therefore in terms of the 6 previously identified candidate taxa, I have no hesitation in naming them as species in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

As already mentioned in the introduction, two relevant species are also found to be sufficiently divergent from others in *Atheris sensu lato* as to warrant being named as within a separate newly named subgenus, as well as another separately divergent species to be moved to another newly erected subgenus.

Atheris barbouri Loveridge, 1930 is also split two ways, with the formal description of a new subspecies.

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 20 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. It should be noted that in vipers in particular, juveniles can often appear quite different in colour to mature adults, as can be each sex in adults.

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.

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 gang 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).

CONSERVATION THREATS TO THE NEWLY NAMED TAXA AND RELATIVES

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

Alternatively, remaining populations in forest or habitat isolates, even if being formally preserved, as is happening in some cases, are now cut off from exits or spreading by way of human encroachment.

Small population sizes, in what are best seen as islands, are of course at higher risk of extinction due to some unforeseen calamity on a particularly small remnant population.

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 regimes.

The sub-Saharan African 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.

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).

PIERSONVIPERA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:27CA4BFB-929F-4796-9197-BF397F1FB7DB

Type species: *Piersonvipera piersoni* sp. nov.

Diagnosis: The subgenus *Piersonvipera* subgen. nov. includes species within the genus *Atheris* Cope, 1862 *sensu lato* that are about 13 MYA divergent from other members of the genus according to the evidence of Smid and Tolley (2019).

Snakes within *Piersonvipera* subgen. nov. are separated from all other species of *Atheris* (*sensu lato*) by the following suite of characters:

- (1) Small adult size, maximum length 384mm (all other *Atheris* exceed 580mm TL, with the exception of - *A. katangensis* De Witte, 1953, TL 397mm; *A. barbouri* Loveridge, 1930, TL 369 mm (Barbour and Howell, 1998); and the unique type of *A. acuminata* Broadley, 1998, TL 440mm);
 - (2) The lack of 'horns' (enlarged supraocular scales are present in *A. ceratophora* Werner, 1896);
 - (3) The lack of lanceolate or acuminate scales on top of the head (present in *A. hispida* Laurent, 1955 and *A. acuminata*);
 - (4) Having weakly keeled gular scales (smooth only in *A. nitschei* Tornier, 1902 and *A. woosnami* Boulenger, 1906; gulars moderately keeled in the eastern species, *A. rungweensis* Bogert, 1940, *A. desaixi* Ashe, 1968, *A. ceratophora* and *A. katangensis*, and strongly keeled in the remaining central and western species);
 - (5) Lacking interocularials (*sensu* Broadley, 1998, i.e. the supralabials are in contact with circumorbitals; 1 or 2 in *A. desaixi* and *A. rungweensis*);
 - (6) Having 19-21 transverse head scales (*sensu* Broadley, 1998, i.e. number of scales across head between posterior supralabials; these are reduced in highly arboreal species, e.g. *A. squamigera* Hallowell, 1854, 15-22, *A. hispida*, 12; and *A. acuminata*, 10);
 - (7) Having 21-23 Midbody scale rows, (MSR) (most species have 27+ MSR rows; reduced in highly arboreal species such as *A. squamigera*, 15-25, *A. hispida*, 15-19, and *A. acuminata*, 14);
 - (8) Lateral body scales not serrated (strongly serrated in *A. ceratophora*, *A. desaixi*, *A. nitschei* Tornier, 1902, *A. woosnami* and *A. rungweensis*, and weakly serrated in *A. katangensis*);
 - (9) Having 8-9 supralabials (six in *A. acuminata*, 10-12 in *A. desaixi*);
 - (10) Having low ventral counts 128-137 (this is the lowest in the genus; usually over 140 in both sexes in *A. nitschei*, *A. woosnami* Boulenger, 1906, *A. rungweensis*, *A. desaixi*, *A. chlorechis* (Pel, 1852), *A. hispida*, *A. mongoensis* Collet and Trape, 2020, *A. matildae* Menegon, Davenport and Howell, 2011 and *A. subocularis* Fischer, 1888, and in the only known males of *A. acuminata* (160) and *A. hirsuta* Ernst and Rödel, 2002 (160));
 - (11) Having low subcaudal counts - 39-47 (always higher than 45 in *A. rungweensis*, *A. ceratophora*, *A. chlorechis*, *A. squamigera* and *A. hispida*; and 54 and 58 in the only known males of *A. acuminata* and *A. hirsuta*, and 50 or more in *A. hetfieldi* respectively);
 - (12) Having a prehensile tail (non-prehensile in *A. barbouri*), and higher subcaudal (*A. barbouri* 15-21) and labial (*A. barbouri*, supralabials 5-6, infralabials 4-5) counts (modified from Branch and Bayliss 2009).
- Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:
- No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri* which is largely terrestrial).
- Snakes in the closely related genus *Proatheris* Broadley, 1966 are

separated by the presence of an enlarged supraocular shield. Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

Distribution: Known only from Mount Namuli (*A. (Piersonvipera) piersoni* sp. nov.) and Mount Mabu (*A. (Piersonvipera) mabuensis* (Branch and Bayliss, 2009)), both locations in northern Mozambique, south-east Africa.

Etymology: The subgenus *Piersonvipera* subgen. nov. and species *Atheris (Piersonvipera) piersoni* sp. nov. (this paper) are both formally named in honour of Charles Pierson of Moss Vale, New South Wales, Australia in recognition of his amazing sacrifices and contributions to wildlife conservation in Australia.

For details see the account in Hoser (1996).

Content: *Atheris (Piersonvipera) piersoni* sp. nov. (type species); *A. (Piersonvipera) mabuensis* (Branch and Bayliss, 2009).

ATHERIS (PIERSONVIPERA) PIERSONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:BB6E156D-A2FB-4BF6-AE8C-8BF89453166C

Holotype: A preserved specimen at the Port Elizabeth Museum Herpetology Collection, now known as Bayworld, Gqeberha, South Africa, Africa, specimen number PEM R17904, collected on a path at 1 PM in leaf litter in Khara Forest (lower end on Manho Forest), Mount Namuli, Zambezia Province, Mozambique, Africa, Latitude 15.24399 S., Longitude 37.02165 E. at about 1550 metres ASL by Colin Congdon on 26 November 2008.

This facility allows access to its holdings.

Diagnosis: The two species from this subgenus *Atheris (Piersonvipera) piersoni* sp. nov. and *A. (Piersonvipera) mabuensis* (Branch and Bayliss, 2009) are readily separated from one another as follows:

A. piersoni sp. nov. has a bluish tinge in colour, not seen in *A. mabuensis*, and has reddish scale tips on the body, vs yellowish in *A. mabuensis*.

A. piersoni sp. nov. has 128 ventrals, 22 mid body rows, 6 crown scales between crown oculars, 19 crown scales (n=1 male) vs 132-137 ventrals, 23-26 mid body rows 7-8 crown scales between crown oculars, 21-22 crown scales (n=4 both sexes).

A. mabuensis usually has a head pattern with a well-developed inverted 'V'-shape, but sometimes reduced to two isolated dark blotches at the back of the head in the holotype. This head pattern is virtually absent in *A. piersoni* sp. nov..

Both *A. piersoni* sp. nov. and *A. mabuensis* are depicted in life in Branch and Bayliss (2009), and identified effectively by their collection locality, with the specimen from Mount Namuli being *A. piersoni* sp. nov. and those from Mount Mabu being *A. mabuensis*.

The two preceding species, being the entirety of the subgenus *Piersonvipera* subgen. nov.

are separated from all other species of *Atheris (sensu lato)* by the following suite of characters:

- (1) Small adult size, maximum length 384mm (all other *Atheris* exceed 580mm TL, with the exception of - *A. katangensis* De Witte, 1953, TL 397mm; *A. barbouri* Loveridge, 1930, TL 369 mm (Barbour and Howell, 1998); and the unique type of *A. acuminata* Broadley, 1998, TL 440mm);
- (2) The lack of 'horns' (enlarged supraocular scales are present in *A. ceratophora* Werner, 1896);
- (3) The lack of lanceolate or acuminate scales on top of the head (present in *A. hispida* Laurent, 1955 and *A. acuminata*);
- (4) Having weakly keeled gular scales (smooth only in *A. nitschei* Tornier, 1902 and *A. woosnami* Boulenger, 1906; gulars moderately keeled in the eastern species, *A. rungweensis* Bogert, 1940, *A. desaixi* Ashe, 1968, *A. ceratophora* and *A. katangensis*, and strongly keeled in the remaining central and western species);
- (5) Lacking interoculars (*sensu* Broadley, 1998, i.e. the supralabials are in contact with circumorbitals; 1 or 2 in *A. desaixi* and *A. rungweensis*);
- (6) Having 19-21 transverse head scales (*sensu* Broadley, 1998, i.e. number of scales across head between posterior supralabials;

these are reduced in highly arboreal species, e.g. *A. squamigera* Hallowell, 1854, 15-22, *A. hispida*, 12; and *A. acuminata*, 10); (7) Having 21-23 mid-body scale rows (MSR) (most species have 27+ MSR rows; reduced in highly arboreal species such as *A. squamigera*, 15-25, *A. hispida*, 15-19, and *A. acuminata*, 14);

(8) Lateral body scales not serrated (strongly serrated in *A. ceratophora*, *A. desaixi*, *A. nitschei* Tornier, 1902 *A. woosnami* Boulenger, 1906 and *A. rungweensis*, and weakly serrated in *A. katangensis*);

(9) Having 8-9 supralabials (six in *A. acuminata*, 10-12 in *A. desaixi*);

(10) Having low ventral counts 128-137 (this is the lowest in the genus; usually over 140 in both sexes in *A. nitschei*, *A. woosnami*, *A. rungweensis*, *A. desaixi*, *A. chlorechis* (Pel, 1852), *A. hispida*, *A. mongoensis* Collet and Trape, 2020, *A. matildae* Menegon, Davenport and Howell, 2011 and *A. subocularis* Fischer, 1888, and in the only known males of *A. acuminata* (160) and *A. hirsuta* Ernst and Rödel, 2002 (160));

(11) Having low subcaudal counts - 39-47 (always higher than 45 in *A. rungweensis*, *A.*

ceratophora, *A. chlorechis*, *A. squamigera* and *A. hispida*; and 54 and 58 in the only known males of *A. acuminata* and *A. hirsuta*, and 50 or more in *A. hetfieldi* respectively);

(12) Having a prehensile tail (non-prehensile in *A. barbouri*), and higher subcaudal (*A. barbouri* 15-21) and labial (*A. barbouri*, supralabials 5-6, infralabials 4-5) counts (modified from Branch and Bayliss 2009).

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

Distribution: *Atheris (Piersonvipera) piersoni* sp. nov. is known only from Mount Namuli, the highest peak in the Zambezia Province of Mozambique.

Atheris (Piersonvipera) mabuensis (Branch and Bayliss, 2009) is from the Mount Mabu area.

Both locations are in northern Mozambique, south-east Africa.

Comment: While the collection locations of each species as diagnosed above are only about 80 km apart in a straight line, there appears to be generally unsuitable habitat of low elevation in between, prohibiting contact between the relevant populations..

Notwithstanding the lack of genetic evidence of separation, the obvious morphological divergence of the two forms implies long-term separation and on this basis I have chosen to formally name the previously unnamed form as a species rather than subspecies.

Etymology: The subgenus *Piersonvipera* subgen. nov. (this paper) and species *Atheris (Piersonvipera) piersoni* sp. nov. are both formally named in honour of Charles Pierson of Moss Vale, New South Wales, Australia in recognition of his amazing sacrifices and contributions to wildlife conservation in Australia. For details see the account in Hoser (1996).

KENYAVIPERA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:3CE632FF-B061-4362-A459-39E524B65D84

Type species: *Atheris desaixi* Ashe, 1968.

Diagnosis: The snake in this monotypic subgenus is separated from all other species within *Atheris* Cope, 1862 by the following unique combination of characters: A thick bodied snake with 41-54 subcaudals; the snake is not predominantly plain brown on top

with very prickly head scales or found west of Ghana; it has 160-174 ventrals; is found north of latitude 15 Deg. S. (only known from the northern Nyembi Range and the nearby Chuka area, at south-eastern Mount Kenya); lateral scales serrated; no supraocular "horns"; four suprarostrol scales in first (or only) row; dorsals rounded at the apex; each dorsal scale tipped with yellow.

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

Distribution: The sole species in the genus is only known from the northern Nyembi Range and the nearby Chuka area, at south-eastern Mount Kenya, both in Kenya, Africa.

Etymology: Named in reflection of the location this snake subgenus occurs, Kenya, as well as the fact that the snake is a viper.

Content: *Atheris (Kenyavipera) desaixi* Ashe, 1968 (Monotypic).

ATHERIS (ADENORHINUS) CUMMINGAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:3CA33E5F-75A9-46B4-B0EF-A04D2F82701E

Holotype: A preserved specimen at the Museo Tridentino di Scienze Naturali, Trento, Italy, specimen number MTSN 5032, collected from the Kigogo Forest Reserve, Udzungwa Mountains, Tanzania, Latitude: -7.8000 S., Longitude: 36.6833 E. at an elevation of about 1,900 metres ASL.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museo Tridentino di Scienze Naturali, Trento, Italy, specimen number MTSN 5033, collected from the Kigogo Forest Reserve, Udzungwa Mountains, Tanzania, Latitude: -7.8000 S., Longitude: 36.6833 E. at an elevation of about 1,900 metres ASL.

Diagnosis: *Atheris (Adenorhinus) cummingae sp. nov.* known only from the Kigogo Forest Reserve, Udzungwa Mountains, Tanzania has until now been treated as a population of either, *Atheris ceratophora* Werner, 1896, type locality of Usambara Mountains and occurring in suitable habitat blocks between there and the north-east Udzungwa Mountains, all in Tanzania, or more recently as *A. matildae* Menegon, Davenport and Howell, 2011, known from the Rungwe, Ukinga and Misuki blocks near the Tanzania, Malawi border, but based on sequences in Genbank of all three taxa, is clearly of a separate geographically isolated and allopatric species, likely to have diverged from the other two at least 1.5 MYA.

Recent published molecular phylogenies have placed the population herein identified as *Atheris cummingae sp. nov.* as being most closely related to the nepotistically patronym named species *A. matildae* (named after Tim Devenport's then recently born child, aged 5 YO at the time she was honoured, with the spurious claim she was a great herpetologist), with an estimated divergence of 1.5 MYA, rather than *Atheris ceratophora*, from which it diverged about 2.2 MYA, although I note that Menegon *et al.* (2011) identify this taxon as *A. ceratophora*. Elsewhere in the past 15 years it has been identified as either "*Atheris cf. ceratophora*" or "*A. cf. ceratophora*".

The three species are separated from one another by the following three unique combinations of characters:

A. cummingae sp. nov. has a dorsum and flanks that are mainly yellow, rather than blackish and the dark markings are in the form of distinctive brownish-black spots of irregular shape and small to medium on size, some of which may join to form elongated and even more irregularly-shaped dark markings. There are no lines as

such running along the lateral edges of the dorsum as seen in *A. matildae*. The upper surface of the head is mainly yellow, but with some black markings of irregular nature and/or peppering. The supraciliary spines above the eye are all or mainly yellow.

Separating *A. cummingae sp. nov.* from the other two species (*A. ceratophora* and *A. matildae*) is a distinctive dark-brown to black line that starts above the eye and runs to the back of the temple on either side of the head. Because the entirety of the top of the head is blackish in *A. matildae* (see below), this line is not seen in that species. The same line is either absent, broken or faded in *A. ceratophora*. Sides of the head are mainly yellow, save for limited dark pigment at the very edges of some scales.

A. ceratophora has a dorsum and flanks that are mainly yellow, rather than blackish and the dark markings are in the form of distinctive brownish-black spots of irregular shape and small to medium on size, some of which may join to form elongated and even more irregularly-shaped dark markings, but those on the mid dorsum are more prominent than ones on the upper and mid flanks, versus of similar size and intensity in *A. cummingae sp. nov.*. There are no lines as such running along the lateral edges of the dorsum as seen in *A. matildae*. The upper surface of the head is mainly yellow, but with some black markings of irregular nature and/or peppering and in particular at the rear of the head. The supraciliary spines above the eye are all or mainly yellow.

Atheris matildae has a dorsum that is a pattern of mainly black, over a yellow back ground, being mainly black on the mid dorsum and on the upper flanks yellow, intruding in and out of the broader medial line, forming a distinct reticulated pattern, or alternatively tending to be of one. The upper surface of the head is blackish all over (separating this species from *A. cummingae sp. nov.* and *A. ceratophora*) as are the supraciliary spines above the eye. Sides of the head, including labials are yellow; marked brown or peppered brown on edges.

The three species, *A. cummingae sp. nov.*, *A. ceratophora*, *A. matildae* are separated from all other species of *Atheris* Cope, 1862 *sensu lato* by the presence of two or three supraciliary spines above the eye, each composed of a single supraciliary scale, in turn surrounded a series of smaller raised scales.

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

A. matildae in life is depicted in Menegon *et al.* (2011), and online at:

<http://novataxa.blogspot.com/2011/12/atheris-matildae-2011-tanzania.html>

and

<https://news.mongabay.com/2011/12/new-large-horned-viper-discovered-but-biologists-keep-location-quiet/>

A. cummingae sp. nov. in life is depicted online at:

<https://www.inaturalist.org/observations/1648208>

A. ceratophora in life is depicted online at:

<https://www.inaturalist.org/observations/22379210>

and

<https://www.inaturalist.org/observations/22378990>

and

<https://www.inaturalist.org/observations/112048989>

and

<https://www.inaturalist.org/observations/22378907>

Conservation of this taxon: Meshack (2009), noted that the Mufindi forests, of which Kigogo Forest Reserve is an important fragment, is presently known to include the most range restricted species of any location in the Udzungwas, highlighting the conservation significance of this remnant patch, still under threat from encroachment and harvesting from outside.

A. cummingae sp. nov. is a range-restricted endemic only known from the type locality. Other specimens morphologically similar to this snake from other parts of the Udzungwa Mountains area are morphologically and genetically most similar to *A. ceratophora* and therefore referred to that species.

A. cummingae sp. nov. should therefore be formally identified as highly threatened and in a legislative sense, "critically endangered" would be the appropriate legal designation.

This species needs a management plan and appropriate implementation as a matter of urgency.

Included should be the need for multiple captive populations as insurance against extinction. These captives should be held in multiple countries and both within and outside the government sector.

The collection location of the species has not been withheld as to do so is in my view counter-productive to the long-term conservation of the species, noting that this is best achieved by identification of the habitat and ecosystem, making it well-known to people, including the local inhabitants and the subsequent preservation of it as a whole.

I note the recent upsurge of herpetological tourism, where enthusiasts travel to find, catch, photograph and release target species in their natural habitats and this species lends itself to be a target for such eco-tourism.

Distribution: *A. cummingae* sp. nov. is only known from the Kigogo Forest Reserve, within the Mufindi forests within the Udzungwa Mountains area. Specimens that are morphologically and genetically similar to *A. ceratophora* from other parts of the Udzungwa Mountains are referred to that taxon.

Etymology: *A. cummingae* sp. nov. is named in honour of wildlife conservation icon and journalist Fia Cumming of Lyons, Canberra, ACT, Australia, previously of Chatswood, NSW, Australia, in recognition of major contributions and sacrifices for wildlife conservation globally.

See Hoser (1996) for details.

ATHERIS (WOOLFVIPERA) EUANEDWARDSI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:0ED02F11-6C3E-4C4F-838A-82657F304765

Holotype: A preserved specimen at the K.M. Howell collection, University of Dar es Salaam, Dar es Salaam, Tanzania, Africa, specimen number KMH 6150 collected from the Gombe National Park, Tanzania, Latitude 4.6983 S., Longitude 29.6446 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Natural History, London, UK, specimen number BMNH 1 979.982 collected from Kigoma, Tanzania, Africa, Latitude 4.8824 S., Longitude 29.6615 E.

Diagnosis: Until now, both *Atheris euanedwardsi* sp. nov. from Gombe National Park, Tanzania and immediately south of there in the Kigoma area and *A. ernestswilei* sp. nov. from the Ufipa Plateau, Tanzania have been treated as outlier populations of *A. rungweensis* (Bogert, 1940), type locality Rungwe Mountains (southern highlands), Tanzania, a species found in this immediate region only, including immediately adjacent Ukinga uplands and in north-east Malawi in the Misuki uplands.

They are all readily separated from the morphologically similar species *A. nitschei* Tornier, 1902, type locality of Mpororo Swamp, Tanzania, and found in this general region, (as well as the allopatric and divergent *Atheris woosnami* Boulenger, 1906 with a type locality of Mount Ruwenzori, Uganda, herein formally resurrected from the synonymy of *A. nitschei*) by the absence of a black arrowhead marking on top of the head, this being bold, distinct and sometimes fragmented in (*A. nitschei* and *A. woosnami*), as well as the absence of a massive preponderance

of dark pigmentation along a broad mid-dorsal line (broken by light interspaces in *A. woosnami*), combined with generally lighter (green) pigment on the lateral edges of the dorsum and flanks, with only limited amounts of dark, dark spotting, or similar.

(*A. woosnami* is further separated from *A. nitschei* by the reduced size of the arrowmark on the head, with it commencing behind the line between the eyes, versus in front in *A. nitschei*.)

The three species, *Atheris euanedwardsi* sp. nov., *A. ernestswilei* sp. nov. and *A. rungweensis* are readily separated from each other by the following combinations of characters:

Atheris euanedwardsi sp. nov. is generally lime green above, with light yellow fadings forming an indistinct and ill defined reticulatum over the body. Along the mid dorsal line across a moderately broad diameter from the head down is a light grey peppering. Anterior of the upper surface of the head is green, with grey peppering posteriorly. Upper labials are bright yellow at the bottom, becoming green above and this green is then including most of the upper side of the head.

There are no markings of any sort on the labials.

A. ernestswilei sp. nov. is generally greenish on top, but without the faded yellow indistinct and ill defined reticulatum on the body or the flanks as seen in *A. euanedwardsi* sp. nov.. Along the mid-dorsal line is a very slight grey tinge, from the back of the head, where it is reasonably prominent as a marking from the bridge of the eyes backwards, noting it is blunt edged anteriorly and not arrow-shaped as seen in *A. nitschei* or *A. woosnami*. On the dorsum along the mid dorsal line, but positioned alternately along it and away from it, are small dark, blackish blotches of irregular shape, but tending to be triangular, with apex pointing to the midline (laterally), each bounded on the midline sides by lighter yellowish-green, this bright border not on the lower "base" of each triangle.

The labials are generally whitish with dark grey bars or patches, although this is sometimes obscured by peppering of the labials in some specimens, this being the only one of the three relevant species to have labials marked in this way.

A. rungweensis is mainly dark grey on top and the flanks, with a series of bold thin green markings on either side of the midline, on the border of the lateral surfaces, being about 1 scale wide, from head to tail, these being broken on the neck, becoming entire on the upper body and to the tail.

The head is generally even in colour, but a greenish-grey colour, rarely with minor peppering or spots, dark or light. Labials are slightly lighter than above (the top of the head), but there is no obvious markings or colour changes on the labials in any way, with only a gradual change in colour intensity on different parts of the head.

A. nitschei and *A. woosnami* are further separated from *A. euanedwardsi* sp. nov., *A. ernestswilei* sp. nov. and *A. rungweensis* by having scales on top of the head anteriorly smooth or feebly keeled; 18-20 scales across the back of the head between posterior supralabials; dorsal body scales with keels extending to the tip; dorsum yellowish green with an intense and sometimes variable black marking along a well-defined midline.

In turn *A. euanedwardsi* sp. nov., *A. ernestswilei* sp. nov. and *A. rungweensis* have scales on top of the head anteriorly strongly keeled; 24-26 scales across the back of the head between posterior supralabials; dorsal body scales with keels not extending to the tip; dorsum light lime green to blackish, often with symmetrical yellow markings on back of head and dorsolateral yellow zig-zag lines in a reticulatum, or irregularly-shaped triangles or spots or a generally dark colour with generally well defined yellow-green lines crossing on either side of the dorsolateral edge (as a single line on each side) (modified from Loveridge, 1942).

The five preceding species are separated from all other species within *Atheris* Cope, 1862 by the following combination of characters: 39-59 subcaudals; does not have a predominantly brown colour, with very prickly head scales or is found west of Democratic Republic of Congo; 150-165 ventrals; occurs north of 15 Deg. South; lateral scales serrated; no supraciliary "horns"; three to five suprarostrals in first (or only) row; dorsals pointed at

apex; dorsal scales not tipped with yellow; gular scales smooth or feebly keeled; lateral scale rows 2-6 or -8 strongly keeled; dorsum green with irregular black markings or green to blackish with symmetrical yellow markings and/or lines, sometimes indistinct or faded.

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

A. euanedwardsi sp. nov. is depicted online at:

<https://storymaps.arcgis.com/stories/4530ed5edb924a2d991d2b6ef4bf2b53>

A. rungweensis in life is depicted in Menegon *et al.* (2011) in figure 7, middle left and online at:

<https://www.inaturalist.org/observations/120811957>

and

<https://www.inaturalist.org/observations/112271362>

and

<https://www.inaturalist.org/observations/120811991>

A. nitschei is depicted in life in Menegon *et al.* (2011) in figure 7, bottom right and online:

<https://www.inaturalist.org/observations/151711653>

and

<https://www.inaturalist.org/observations/95084667>

A. woosnami in life is depicted online at:

<https://www.inaturalist.org/observations/125589156>

and

<https://www.inaturalist.org/observations/136743961>

Menegon *et al.* (2014) found that *Atheris ernestswilei* sp. nov. and *A. rungweensis* diverged 2.5 MYA which is self-evidently species-level divergence noting no known sympatry or co-existence of the relevant forms. They had no data for *A. euanedwardsi* sp. nov.

They also found that the type form of *A. rungweensis* diverged from the type form of *A. nitschei* 5.4 MYA.

Distribution: *Atheris euanedwardsi* sp. nov. is known only from Gombe National Park, Tanzania and immediately south of there in the Kigoma area and so should be regarded as a range-restricted endemic that is vulnerable to extinction.

Etymology: Named in honour of Euan Edwards, of the Gold Coast, Queensland, Australia, in recognition of his many contributions to herpetology over many decades, including some serious fieldwork in most parts of Africa, including east Africa.

ATHERIS (WOOLFVIPERA) ERNESTSWILEI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:48D2EC86-EA61-4873-87D7-5C8CF81EBE71

Holotype: A specimen lodged at the Southern Highlands Conservation Programme herpetological Collection, Mbeya, Tanzania, specimen number SHCP 07-R-02 collected from Nkasi/Ntantwa, Tanzania, Africa.

This facility allows access to its holdings.

Diagnosis: Until now, both *A. ernestswilei* sp. nov. from the Ufipa Plateau, Tanzania and *Atheris euanedwardsi* sp. nov. found further north in the Gombe National Park, Tanzania and immediately south of there in the Kigoma area have been treated as outlier populations of *A. rungweensis* (Bogert, 1940), type locality Rungwe Mountains (southern highlands), Tanzania, a species found in this immediate region only, including immediately adjacent

Ukinga uplands and in north-east Malawi in the Misuki uplands.

They are all readily separated from the morphologically similar species *A. nitschei* Tornier, 1902, type locality of Mpororo Swamp, Tanzania, and found in this general region, as well as the allopatric and divergent *Atheris woosnami* Boulenger, 1906 with a type locality of Mount Ruwenzori, Uganda, herein formally resurrected from the synonymy of *A. nitschei* by the absence of a black arrowhead marking on top of the head, this being bold, distinct and sometimes fragmented; as well as the absence of a massive preponderance of dark pigmentation along a broad mid-dorsal line (broken by light interspaces in *A. woosnami*), combined with generally lighter (green) pigment on the lateral edges of the dorsum and flanks, with only limited amounts of dark, dark spotting, or similar.

A. woosnami is further separated from *A. nitschei* by the reduced size of the arrowmark on the head, with it commencing behind the line between the eyes, versus in front in *A. nitschei*.

The three species, *Atheris euanedwardsi* sp. nov., *A. ernestswilei* sp. nov. and *A. rungweensis* are readily separated from each other by the following combinations of characters:

Atheris euanedwardsi sp. nov. is generally lime green above, with light yellow fadings forming an indistinct and ill defined reticulatum over the body. Along the mid dorsal line across a moderately broad diameter from the head down is a light grey peppering. Anterior of the upper surface of the head is green, with grey peppering posteriorly. Upper labials are bright yellow at the bottom, becoming green above and this green is then including most of the upper side of the head.

There are no markings of any sort on the labials.

A. ernestswilei sp. nov. is generally greenish on top, but without the faded yellow indistinct and ill defined reticulatum on the body, or the flanks seen in *A. euanedwardsi* sp. nov.. Along the mid-dorsal line is a very slight grey tinge, from the back of the head, where it is reasonably prominent as a marking from the bridge of the eyes backwards, noting it is blunt edged anteriorly and not arrow-shaped as seen in *A. nitschei* or *A. woosnami*. On the dorsum along the mid dorsal line, but positioned alternately along it and away from it, are small dark, blackish blotches of irregular shape, but tending to be triangular, with apex pointing to the midline (laterally), each bounded on the midline sides by lighter yellowish-green, this bright border not on the lower "base" of each triangle.

The labials are generally whitish with dark grey bars or patches, although this is sometimes obscured by peppering of the labials in some specimens, this being the only one of the three relevant species to have labials marked in this way.

A. rungweensis is mainly dark grey on top and the flanks, with a series of bold thin green markings on either side of the midline, on the border of the lateral surfaces, being about 1 scale wide, from head to tail, these being broken on the neck, becoming entire on the upper body and to the tail.

The head is generally even in colour, but a greenish-grey colour, rarely with minor peppering or spots, dark or light. Labials are slightly lighter than above (the top of the head), but there is no obvious markings or colour changes on the labials in any way, with only a gradual change in colour intensity on different parts of the head.

A. nitschei and *A. woosnami* are further separated from *A. euanedwardsi* sp. nov., *A. ernestswilei* sp. nov. and *A. rungweensis* by having scales on top of the head anteriorly smooth or feebly keeled; 18-20 scales across the back of the head between posterior supralabials; dorsal body scales with keels extending to the tip; dorsum yellowish green with intense and sometimes variable black marking along a well-defined midline.

In turn *A. euanedwardsi* sp. nov., *A. ernestswilei* sp. nov. and *A. rungweensis* have scales on top of the head anteriorly strongly keeled; 24-26 scales across the back of the head between posterior supralabials; dorsal body scales with keels not extending to the tip; dorsum light lime green to blackish, often with symmetrical yellow markings on back of head and dorsolateral yellow zig-zag lines in a reticulatum, or irregularly-shaped triangles

or spots or a generally dark colour with generally well defined yellow-green lines crossing on either side of the dorsolateral edge (as a single line on each side) (modified from Loveridge, 1942).

The five preceding species are separated from all other species within *Atheris* Cope, 1862 by the following combination of characters: 39-59 subcaudals; does not have a predominantly brown colour, with very prickly head scales or is found west of Democratic Republic of Congo; 150-165 ventrals; occurs north of 15 Deg. South; lateral scales serrated; no supraciliary "horns"; three to five suprarostrals in first (or only) row; dorsals pointed at apex; dorsal scales not tipped with yellow; gular scales smooth or feebly keeled; lateral scale rows 2-6 or -8 strongly keeled; dorsum green with irregular black markings or green to blackish with symmetrical yellow markings and/or lines, sometimes indistinct or faded.

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

A. euanedwardsi sp. nov. is depicted online at:

<https://storymaps.arcgis.com/stories/4530ed5edb924a2d991d2b6ef4bf2b53>

A. rungweensis in life is depicted in Menegon *et al.* (2011) in figure 7, middle left and online at:

<https://www.inaturalist.org/observations/120811957>

and

<https://www.inaturalist.org/observations/112271362>

and

<https://www.inaturalist.org/observations/120811991>

A. nitschei is depicted in life in Menegon *et al.* (2011) in figure 7, bottom right and online at:

<https://www.inaturalist.org/observations/151711653>

and

<https://www.inaturalist.org/observations/95084667>

A. woosnami in life is depicted online at:

<https://www.inaturalist.org/observations/125589156>

and

<https://www.inaturalist.org/observations/136743961>

Menegon *et al.* (2014) found that *Atheris ernestswilei* sp. nov. and *A. rungweensis* diverged 2.5 MYA which is self-evidently species-level divergence noting no known sympatry or co-existence of the relevant forms. They had no data for *A. euanedwardsi* sp. nov.

They also found that the type form of *A. rungweensis* diverged from the type form of *A. nitschei* 5.4 MYA.

Distribution: *Atheris ernestswilei* sp. nov. is known only from the Ufipa Plateau region of Tanzania (west of Lake Rukwa). It should be regarded as a range-restricted endemic that is vulnerable to extinction.

Etymology: Named in honour of Ernest Swile of Athlone (Cape Town), South Africa, in recognition of his assistance's with herpetological fieldwork across Africa.

ATHERIS (POECILOSTOLUS) MARLENESWILEAE SP. NOV.

LSIDDurn:lsid:zoobank.org:act:FB7C9598-6553-42B2-A9AA-8BD7AFAF6662

Holotype: A preserved specimen at the Natural History Museum of Zimbabwe, Bulawayo, Zimbabwe, specimen number NMZB-UM 5393 collected from Kakamega Forest, Kenya, Africa, Latitude

0.2913 N., Longitude 34.8565 E.

This facility allows access to its holdings.

Paratypes: 1/ Two preserved specimens at the Natural History Museum of Zimbabwe, Bulawayo, Zimbabwe, specimen numbers NMZB-UM 6518-9 collected from Kakamega Forest, Kenya, Africa, Latitude 0.2913 N., Longitude 34.8565 E.

2/ 64 preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ Herp R-40797, 40799, 40800, 40805, 40806, 40807, 40808, 40810, 40812, 40815, 40818, 40820, 40821, 40823, 40824, 40825, 40826, 40827, 40828, 40829, 40830, 40831, 40833, 40834, 40835, 40836, 40838, 40841, 40796, 40798, 40801, 40802, 40803, 40804, 40809, 40811, 40813, 40814, 40816, 40817, 40819, 40822, 40832, 40837, 40839, 40840, all collected at Kaimosa, Kakamega, Kenya, Africa, Latitude .2055555 N., Longitude 34.491667 E.

Diagnosis: Until now *Atheris marleneswileae* sp. nov. has been treated as a population of

A. squamigera Hallowell, 1854 (in the subgenus *Poecilostolus* Günther, 1863).

There are several populations of *A. squamigera* Hallowell, 1854 type location Gabon, Guinea, that have been described as other species and subspecies, but all have been previously listed and synonymised by Loveridge (1957) and Broadley (1998).

Notwithstanding the preceding, there is clear evidence of regional divergence and allopatry between the populations, implying species-level divisions.

At the barest minimum, this includes "*Atheris squamigera robusta* Laurent, 1956" with a type locality of Ituru, Democratic Republic of Congo (DRC), which is morphologically divergent to the type form and formally recognised as a separate species.

A. robusta as recognized herein occurs in the region of east DRC and nearby Uganda, west of Lake Victoria and including western Tanzania further south. *A. marleneswileae* sp. nov. occurs east of Lake Victoria and Lake Kyoga in the forested areas around Kakamega, Kenya. *A. squamigera* occupies the rest of the range for the putative taxon, being most of the DRC, Congo (Brazzaville), Equatorial Guinea, Gabon, Cameroon, Central African Republic, east Nigeria and Angola.

The three species, *A. squamigera*, *A. robusta* and *A. marleneswileae* sp. nov. are separated from one another by the following unique character combinations:

A. squamigera has a dorsal pattern characterised by a greenish dorsum with distinctive whitish, creamish, or lighter green semi-irregular narrow crossbands, often broken and with scale tips on the dorsum either green, light green, or sometimes whitish tipped, or otherwise as just detailed but yellowish instead. Under the chin, the scales are green. There are 12-13 scales around (and) entering the eye. Iris is green.

A. robusta has a greenish-brown dorsum with the crossbands reduced, with each being simply 3-5 yellowish or yellow tipped scales, as well as a separate layer of dull yellowish brown scales (or parts thereof) on the dorsum or flanks. Most scale tips on the dorsum and flanks are slightly yellow tipped. Under the chin the scales are yellow. There are 13-14 scales around (and) entering the eye. Iris is bluish-grey.

A. marleneswileae sp. nov. is similar in colour to *A. robusta*, but is separated from that taxon by having a strong reddish or brown tinge over the dorsum and flanks, scale tips are yellowish-brown, this extending back onto the mid scales giving the snake are more brownish colour, being a greenish-purply-brown snake instead. Lower labials are green, with other chin shields yellow in colour. There are usually 15 scales around (and) entering the eye. Iris is brown to golden in colour.

The three preceding species are separated from all others in the genus *Atheris* Cope, 1862, *sensu lato* by the following unique combination of characters:

Lateral scales not, or but feebly and irregularly serrated; no supraocular horns. Rostral three times as wide as deep, surmounted by 3-5 suprarostrals and 5 keeled internasals. Nasals

entire, separated from the eye by 1-3 scales (usually 2); one or two scales between eye and nasal. Dorsal and lateral head shields strongly keeled, 5-11 interorbitals and 15-22 scales across back of head between the posterior supralabials. Eye moderate, its vertical diameter is slightly greater than its distance from the lip. There is rarely a row of scales between the 10-18 circumorbitals and the 7-13 supralabials, usually fourth to sixth below the eye. Midbody scale rows 15-25; scales on neck are lanceolate or acuminate; 2-5 lateral scale rows, frequently duplicated; interorbital scales strongly keeled; interoculabials usually absent (modified from Broadley 1998).

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

A. squamigera in life is depicted online at:

<https://www.inaturalist.org/observations/35974716>

and

<https://www.inaturalist.org/observations/3971446>

and

<https://www.inaturalist.org/observations/97472250>

A. robusta in life is depicted online at:

<https://www.inaturalist.org/observations/26674315>

and

<https://www.inaturalist.org/observations/137163256>

A. marleneswilaie sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/mp7/51102635468/>

and

<https://www.flickr.com/photos/mp7/51044740618/>

and

<https://www.inaturalist.org/observations/125373213>

and

<https://www.inaturalist.org/observations/69927141>

and

<https://www.inaturalist.org/observations/102132834>

Distribution: *Atheris marleneswilaie* sp. nov. is known only from the region of the type locality, Kakamega Forest, Kenya, Africa, being immediately east of Lake Victoria, Kenya. It should be regarded as a range-restricted taxon that is vulnerable to extinction.

Etymology: Named in honour of Marlene Swile of Mitchell's Plain (Cape Town), South Africa, in recognition of her assistance with herpetological fieldwork across Africa.

ATHERIS BARBOURI DIVERGANS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:4D11B56C-052E-4158-B18B-B560E6918C15

Holotype: A preserved specimen at the Museo Tridentino di Scienze Naturali, Trento, Italy, specimen number MTSN 7299 collected from Madehani, Ukinga Mountains, Tanzania, Africa, Latitude 9.3342 S., Longitude 34.0633 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Natural History Museum, London, UK, specimen number BMNH 1931.6.6.9 collected from Madehani, Ukinga Mountains, Tanzania, Africa, Latitude 9.3342 S., Longitude 34.0633 E.

Diagnosis: The subspecies *Atheris barbouri divergans* subsp. nov. is confined to the Ukinga Mountains, Tanzania, while the

morphologically similar nominate form *Atheris barbouri* Loveridge, 1930 has a type locality of "Dabaga, Uzungwa Mountains, southeast of Iringa" Tanzania and also occurs in the Southern Highlands of Tanzania.

The two subspecies are separated as follows:

A. barbouri of the nominate form has beige to white rear upper labials and the second and third upper labials past the nostril are of similar size, versus yellowish, sometimes with a greenish tinge rear upper labials and the third upper labial past the nostril is usually much larger than the second in *A. divergans* subsp. nov..

Atheris barbouri (both subspecies) is the only member of the genus *Atheris* Cope, 1862, including all subgenera, to have less than 22 subcaudals and be generally a ground dweller.

Snakes in the genus *Atheris* Cope, 1862 including all subgenera are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the other closely related genus *Montatheris* Broadley, 1996 are separated by the presence of paired subcaudals (versus single in *Atheris* Cope, 1862) and by having a tail that is not prehensile.

The type form of *Atheris barbouri* is depicted in Menegon *et al.* (2011) on page 52 in Fig 7, top left.

Atheris barbouri divergans subsp. nov. is depicted in Menegon *et al.* (2011) on page 52 in Fig. 7, at top right or online at: <https://www.inaturalist.org/observations/1790296>

Menegon *et al.* (2014) found that *Atheris barbouri divergans* subsp. nov. diverged from *A. barbouri* about 700 thousand YBP. Combined with limited morphological divergence and allopatry supported by a barrier not penetrable by either population, subspecies-level recognition of the newly named taxon is appropriate.

Distribution: The subspecies *Atheris barbouri divergans* subsp. nov. is confined to the Ukinga Mountains, Tanzania, while the morphologically similar nominate form *Atheris barbouri* Loveridge, 1930 has a type locality of "Dabaga, Uzungwa Mountains, southeast of Iringa" Tanzania and also occurs in the Southern Highlands of Tanzania.

Etymology: *A. barbouri divergans* subsp. nov. is named in reflection of the fact that it is a divergent subspecies. The spelling of the subspecies name "*divergans*" is intentional and should not be changed.

MONTATHERIS JOSEPHBURKEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:D316CED9-4540-4318-BC56-484CBE75B850

Holotype: A preserved specimen in the collection of the Natural History Museum, London, UK, specimen number NHMUK ZOO 1950.1.2.69 collected from 1 mile west of Rutundu, Mount Kenya, (about 20 km North East of Mount Kenya), Kenya, Africa, Latitude 0.0412 S., Longitude 37.4635 E.

This facility allows access to its holdings.

Diagnosis: Until now, *Montatheris josephburkei* sp. nov. known only from the high altitude slopes of Mount Kenya has been treated as an isolated population of *Montatheris hindii* Boulenger, 1910.

That taxon has a given type locality of "Fort Hall, Kenya". Based on Boulenger's original description of the specimen's colouration, it is self-evidently of the Aderdare Range form, this range also being proximal to Fort Hall.

Fort Hall does however sit between both areas putative "*Montatheris hindii*" occurs.

While the ranges of each of *M. josephburkei* sp. nov. and *M. hindii* are proximal and potentially within 10 km of each other, based on

potential habitat, the altitude barrier dividing the two populations is sufficient to have maintained long term isolation.

However to date specimens of each taxon have not been found within 20 km of each other.

The divergence of the two populations of what has until now been treated as one species, is confirmed by the substantial consistent morphological divergence between the two species.

The two species are separated by the following character suites:

M. hindii is grey or brown in overall colour (grey/beige overlay) usually and has well defined dark shapes running along either side of the dorsolateral edge, being mainly more-or-less triangular in shape and with whitish borders on the outer edges (*sensu* Boulenger 1910) and has 12-13 scales around the eye, versus reddish (usually, poorly defined dark shapes running along either side of the dorsolateral edge, usually without obvious whitish borders on the outer edges and 14-16 scales around the eye in *M. josephburkei* sp. nov. (versus 12-13 scales in *M. hindii*).

The two preceding species, being the entirety of the genus *Montatheris* Broadley, 1998 are separated from the closely related genus *Atheris* Cope, 1862 by the presence of paired subcaudals (versus single in *Atheris*) and by having a tail that is not prehensile. Snakes in the closely related genus *Proatheris* Broadley, 1966 are separated by the presence of an enlarged supraocular shield.

Snakes in the genus *Atheris*, as well as the genera *Montatheris* and *Proatheris* including all subgenera within *Atheris*, are separated from all other African vipers by the following unique suite of characters:

No single small horn above the eye; pupil vertical; many small scales on top of the head; head is not pear shaped; tail long; 38-65 single subcaudals; occurs in mid altitude woodland or forest; usually a mixture of black, yellow and/or green in life and arboreal in habit (excluding it seems *A. barbouri*).

M. josephburkei sp. nov. in life is depicted online at: <https://www.inaturalist.org/observations/142676665>

M. hindii in life is depicted in Spawls *et al.* (2011) on page 495 at top right and online at: <https://www.inaturalist.org/observations/155358086>

and

<https://www.inaturalist.org/observations/69810726>

Distribution: *Montatheris josephburkei* sp. nov. is known only from the high altitude slopes of Mount Kenya (between 2700 to 3800 metres ASL). *Montatheris hindii* Boulenger, 1910 is herein confined to the Aberdare Mountains, Kenya at similar altitude (Spawls *et al.* 2011), although Boulenger's type specimen was taken from about 4000 feet ASL (about 1,333 metres). Both species appear to be confined to treeless moorland and fortunately are known only from areas that are protected. While both are range restricted endemics, they appear to be relatively secure as compared to many other reptile taxa and should at the present time be listed as "vulnerable" species.

Etymology: *M. josephburkei* sp. nov. is named in honour of Joseph Burke of (Fairfield), Melbourne, Victoria, Australia, a highly regarded criminal defence lawyer for services to the legal profession in Australia, including fighting the endemic police corruption in the State of Victoria and (mostly) successfully defending in court, people maliciously charged with fake offences by corrupt police.

REFERENCES CITED

Akeret, B. 2004. Grundlagen der Giftschlangenhaltung. *Draco* 5(17):37-53.

Akeret, B. 2010. Terrarienpflanzen. *Draco* 11(41):4-21.

Angel, F. 1925. Résultats Scientifiques. Vertébrata. Reptiles et Batraciens. [*Mabuia (Mabuiopsis) jeanneli*, *Lygosoma graueri quinquedigitata*, *Ablepharus massaiensis*]. In: *Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale* (1911-1912). Paris, France:2:1-63.

Ashe, J. 1968. A new Bush Viper. *J. E. Afr. Nat. Hist. Soc. Natn. Mus.* 27(1):53-59.

Auerbach, R. D. 1987. *The Amphibians and Reptiles of Botswana*.

Mokwepa Consultants, Botswana: 295 pp.

Baptista, N. L., António, T. and Branch, W. R. 2019. The herpetofauna of Bicular National Park and surroundings, southwestern Angola: A preliminary checklist. *Amphibian and Reptile Conservation* 13(2):96-130.

Barbour, T. 1914. Some new reptiles. *Proceedings of the New England Zoological Club* 4:95-98.

Barbour, T. and Amaral, A. D. 1927a. Studies on African ophidia. *Bull. Antivenin Inst. America* 1(1):1-3.

Barbour, T. and Amaral, A. D. 1927b. Studies on African Ophidia. *Bull. Antivenin Inst. America* 1(1):25-27.

Barbour, T. and Loveridge, A. 1928. A comparative study of the herpetological fauna of the Uluguru and Usambara mountains, Tanzania Territory with descriptions of new species. *Mem. Mus. comp. Zool. Cambridge* (Massachusetts), 50(2):85-265.

Barnett, L. K. 2001. The herpetofauna of Abuko Nature Reserve, the Gambia. *Herpetological Bulletin* (77):5-1.

Barnett, L. K. and Emms, C. 2005. *Common reptiles of The Gambia*. Rare Repro, Hailsham, East Sussex, UK:24 pp.

Bates, M. F., Branch, W. R., Bauer, A. M., Burger, M., Marais, J., Alexander, G. J. and de Villiers, M. S. (eds.) 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland. Suricata 1*. South African National Biodiversity Institute, Pretoria, South Africa:512 pp.

Bayliss, J., Timberlake, J., Branch, W. R., Bruessow, C., Collins, S., Congdon, C., Curran, M., De Sousa, C., Dowsett, R., Dowsett-Lemaire, F., Fishpool, L., Harris, T., Herrmann, E., Georgiadis, S., Kopp, M., Liggitt, B., Monadjem, A. and Patel, H., R 2014. The discovery, biodiversity and conservation of Mabu forest: The largest medium-altitude rainforest in southern Africa. *Oryx* 48:177-185.

BBC World 2021. Catholic Church child sexual abuse scandal. *BBC World Report* 5 Oct 2021, online at: <https://www.bbc.com/news/world-44209971>

Behangana, M., Magala, R., Katumba, R., Ochanda, D., Kigoolo, S., Mutebi, S., Dendi, D., Luiselli, L. and Hughes, D. F. 2020. Herpetofaunal diversity and community structure in the Murchison Falls-Albert Delta Ramsar site, Uganda: Herpetofaunal diversity. *European Journal of Ecology*, 6(2):1-17.

Beolens, B., Watkins, M. and Grayson, M. 2011. *The Eponym Dictionary of Reptiles*. Johns Hopkins University Press, Baltimore, USA:xvi+296 pp.

Berkheimer, R. 1996. Want to get lens-to-nose with venomous snakes? *Reptile and Amphibian Magazine* (February):66-71.

Bittencourt-Silva, G. B. 2019. Herpetological survey of western Zambia. *Amphibian and Reptile Conservation* 13(2):1-28.

Boettger, O. 1887. Diagnoses reptilium novorum ad ill. viro Paul Hesse in finibus fluminis Congo repertorum. *Zoologischer Anzeiger* 10(267):649-651.

Bogert, C. M. 1940. Herpetological results of the Vernay Angola Expedition. I. Snakes, including an arrangement of the African Colubridae. *Bull. Amer. Mus. Nat. Hist.* 77:1-107.

Böhme, W. 1987. Seltene Reptilien aus dem Uzungwe-Gebirge, Süd-Tansania. *Herpetofauna* 9(48):27-34.

Böhme, W., Rödel, M., Brede, C. and Wagner, P. 2011. The reptiles (Testudines, Squamata, Crocodylia) of the forested southeast of the Republic Guinea (Guinée forestière), with a country-wide checklist. *Bonn zoological Bulletin* 60(1):35-61.

Boulenger, G. A. 1896. *Catalogue of the snakes in the British Museum, Vol. 3*. Taylor and Francis, London, UK:xiv+727 pp.

Boulenger, G. A. 1897a. A list of reptiles and batrachians from the Congo Free State, with the description of two new snakes. *Annals And Magazine of Natural History* (6)19:276-281.

Boulenger, G. A. 1897b. Description of a new snake from Usambara, German East Africa. *Annals And Magazine of Natural History* (6)19:281.

Boulenger, G. A. 1901. Matériaux pour la faune du Congo. Batraciens et reptiles nouveaux. *Ann. Mus. Congo Belge, Zool.* (sect. C. ser. 1) 2:7-14.

- Boulenger, G. A. 1906a. Additions to the herpetology of British East Africa. *Proceedings of the Zoological Society of London* 2:570-573.
- Boulenger, G. A. 1906b. Description of a new Tree-Viper from Mount Ruwenzori. *Annals And Magazine of Natural History* (7)18:37-38.
- Boulenger, G. A. 1907. Descriptions of three new snakes discovered by Mr. G. L. Bates in south Cameroon. *Annals And Magazine of Natural History* (7)19:324.
- Boulenger, G. A. 1910. Descriptions of four new African snakes in the British Museum. [*Helicops gendri*]. *Annals And Magazine of Natural History* (8)5:512-513.
- Bowcott, O. and Sherwood, H. 2020. Child sexual abuse in Catholic church 'swept under the carpet', inquiry finds. *The Guardian* 11 November online at: <https://www.theguardian.com/world/2020/nov/10/child-sexual-abuse-in-catholic-church-swept-under-the-carpet-inquiry-finds>
- Branch, W. R. 1986. Hemipenial morphology of African snakes: a taxonomic review. Part 1. Scolecophidia and Boidae. *Journal of Herpetology*, 20:285-299.
- Branch, W. R. 1993. *A Photographic Guide to Snakes and Other Reptiles of Southern Africa*. Struik Publishers, Cape Town, South Africa:144 S.
- Branch, W. R. and Bayliss, J. 2009. A new species of *Atheris* (Serpentes: Viperidae) from northern Mozambique. *Zootaxa* (PRINO) (Online) 2113:41-54.
- Branch, W. R. and Rödel, M. -O. 2003. Herpetological survey of the Haute Dodo and Cavally forests, western Ivory Coast, Part II: Trapping, results and reptiles. *Salamandra* 39(1):21-38.
- Branch, W. R., Bayliss, J., Bittencourt-Silva, G. B., Conradie, W., Engelbrecht, H. M., Loader, S. P., Menegon, M., Nanvonamuquitxo, C. and Tolley, K. A. 2019. A new species of tree snake (Dipsadoboa, Serpentes: Colubridae) from 'sky island' forests in northern Mozambique, with notes on other members of the *Dipsadoboa wernerii* group. *Zootaxa* (PRINO) (Online) 4646(3):541-563.
- Branch, W. R., Rödel, M. -O. and Marais, J. 2005. Herpetological survey of the Niassa Game Reserve, northern Mozambique - Part I: Reptiles. *Salamandra* 41(4):195-214.
- Branch, W. R., Pinto, P. V., Baptista, N. and Conradie, W. 2019. The Reptiles of Angola: History, Diversity, Endemism and Hotspots. Chapter 13, being pp. 283-334 in: B. J. Huntley *et al.* (eds.), *Biodiversity of Angola*. Springer Verlag, Germany:549 pp.
- Briscoe, M. S. 1949. Notes on Snakes Collected in Liberia. *Copeia* 1949(1):16-18.
- Broadley, D. G. 1960. *Vipera superciliaris* - a rare viper added to the Nyasaland list. *Journal of the Herpetological Association of Rhodesia* 12:3-4.
- Broadley, D. G. 1989. *Atheris* Cope 1862 (Reptilia, Serpentes): proposed conservation, and proposed confirmation of *Vipera chlorechis* Pel [1851] as the valid name of the type species. *Bull. zool. Nomenclature* 46(4):264-266.
- Broadley, D. G. 1996. A review of the tribe Atherini (Serpentes: Viperidae), with the descriptions of two new genera. *African Journal of Herpetology* 45:40-48.
- Broadley, D. G. 1998. A review of the genus *Atheris* Cope (Serpentes: Viperidae), with the description of a new species from Uganda. *The Herpetological Journal* 8:117-135.
- Broadley, D. G. and Blaylock, R. 2013. *The Snakes of Zimbabwe and Botswana*. Chimaira, Frankfurt, Germany:387 pp.
- Broadley, D. G. and Cotterill, F. P. D. 2004. The reptiles of southeast Katanga, an overlooked 'hot spot'. *African Journal of Herpetology* 53(1):35-61.
- Broadley, D. G. and Howell, K. M. 1991. A check list of the reptiles of Tanzania, with synoptic keys. *Syntarsus* 1:1-70.
- Broadley, D. G., Doria, C. T. and Wigge, J. 2003. *Snakes of Zambia. An Atlas and Field Guide*. Edition Chimaira, Frankfurt, Germany:280 pp.
- Burger, M., Branch, W. R. and Channing, A. 2004. Amphibians and Reptiles of Monts Doudou, Gabon: Species Turnover Along an Elevational Gradient. *California Academy of Sciences Memoir* 28:145-186.
- Carlino, P. and Pauwels, O. S. G. 2015. An Updated Reptile List of Ivindo National Park, the Herpetofaunal Hotspot of Gabon. *Bulletin Chicago Herpetological Society* 50(3):25-39.
- Cerfaco, L. M. P., Mariana, P. M. and Bauer, A. M. 2020. The Bush Vipers, Genus *Atheris* Cope, 1862 (Squamata: Viperidae) of Bioko Island, Gulf of Guinea, with the Description of A New Species. *Zootaxa* (PRINO) (Online) 4838(4):581-593.
- Ceraico, L. M. P., Aesch, E., Ah Yong, S. T., Ballerio, A., Bouchard, P., Bourgoïn, T., Dmitriev, D., Evenhjus, N., Grygier, M. J., Harvey, M. S., Kottelat, M., Kluge, N., Krell, F. T., Kojima, J., Kullander, S. O., Lucinda, P., Lyal, C. H. C., Pyle, R. L., Rheindt, F. E., Scioscia, C. L., Welter-Schultes, F., Whitmore, D., Yanega, D., Zhang, Z. Q., Zhou, H. Z., Pape, T. (being a unanimous voice of the ICZN) 2023. Renaming taxa on ethical grounds threatens nomenclatural stability and scientific communication. *Zoological Journal of the Linnean Society*, 197, 283-286.
- Chabanaud, P. 1916. Énumération des Ophidiens non encore étudiés de l'Afrique occidentale, appartenant aux Collections du Muséum avec le description des espèces et des variétés nouvelles. *Bull. Mus. natn. Hist. nat. Paris* 22:362-382.
- Chabanaud, P. 1917. Descriptions de trois espèces nouvelles de Reptiles de l'Afrique. *Bull. Mus. nat. Hist. nat. Paris* 23:219-225.
- Chifundera, K. 1990. Snakes of Zaire and their bites. *Afr. Stud. Monogr.* (Kyoto:Japan) 10(3):137-157.
- Chippaux, J. P. 2006. *Les serpents d'Afrique occidentale et centrale*. IRD editions, Paris, France:311 pp.
- Chippaux, J. P. and Jackson, K. 2019. *Snakes of Central and Western Africa*. Johns Hopkins University Press, USA:448 pp.
- Chirio, L. 2009. Inventaire des reptiles de la région de la Réserve de Biosphère Transfrontalière du W (Niger/Bénin/Burkina Faso: Afrique de l'Ouest). *Bull. Soc. Herp. France* (132):13-41.
- Chirio, L. and Lebreton, M. 2007. *Atlas des reptiles du Cameroun*. MNHN, IRD, Paris, France:688 pp.
- Chirio, L. and Ineich, I. 2006. Biogeography of the reptiles of the Central African Republic. *African Journal of Herpetology* 55(1):23-59.
- Cimatti, E. 2006. Reptile Parks in Tanzania. *Reptilia* (GB)(48):52-59.
- Cogger, H. G. 2014. *Reptiles and Amphibians of Australia* (Seventh edition), CSIRO. Sydney, Australia:1064 pp.
- Collett, M. and Trape, J. 2020. Une nouvelle espèce du genre *Atheris* Cope, 1862, de la province de l'Équateur en République Démocratique du Congo (Squamata: Viperidae). *Bull. Soc. Herp. France* 173:27-40.
- Conradie, W., Bittencourt-Silva, G. B., Engelbrecht, H. M., Loader, S. P., Menegon, M., Nanvonamuquitxo, C., Scott, M. and Tolley, K. A. 2016. Exploration into the hidden world of Mozambique's sky island forests: new discoveries of reptiles and amphibians. *Zoosystematics and Evolution* 92(2):163-180.
- Conradie, W., Branch, W. R. and Watson, G. 2019. Type specimens in the Port Elizabeth Museum, South Africa, including the historically important Albany Museum collection. Part 2: Reptiles (Squamata). *Zootaxa* (PRINO) (Online) 4576(1):1-45.
- Conradie, W., Baptista, N. D., Verburgt, L., Keates, C., Harvey, J., Julio, T. and Neef, G. 2021. Contributions to the herpetofauna of the Angolan Okavango-Cuando-Zambezi river drainages. Part 1: Serpentes (snakes). *Amphibian and Reptile Conservation* 15(2):244-278.
- Capocaccia, L. 1961. Contributo allo studio dei serpenti delle isole del Golfo di Guinea. *Ann. Mus. civ. Stor. nat. Genova*, 72:285-309.
- Cope, E. D. 1860. Catalogue of the venomous serpents in the Museum of the Academy of Natural Sciences of Philadelphia, with notes on the families, genera and species. *Proceedings of the Academy of Natural Sciences of Philadelphia* 1859:332-347.
- Cope, E. D. 1862. Notes upon some reptiles of the Old World.

- Proceedings of the Academy of Natural Sciences of Philadelphia* 14:337-344.
- Cotton, T. 2014. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see BZN 70: 234-237, 71: 30-38; 133-135). *Bulletin of Zoological Nomenclature* 71(3):181-182.
- Dehling, J. M. and Dehling, D. M. 2012. Dzanga-Sangha. Auf Froschsuche zwischen Elefanten und Gorillas. *Reptilia* Münster, Germany:17(98):99-109.
- Demos, T. C., Agwanda, B. and Myers, E. A. 2013. *Montatheris hindii* (Kenya montane viper) diet. *Herpetological Review* 44(3):524-525.
- de Witte, G. F. (see for Witte).
- Dobey, M. 2007. *Atheris squamigera*. *Reptilia* Münster, Germany 12(68):51-54.
- Dobey, M. and Vogel, G. 2007. *Venomous Snakes of Africa - Giftschlangen Afrikas*. Terralog 15, Edition Chimaira, Germany:150 pp.
- Dowling, H. G. and Savage, J. M. 1960. A guide to the snake hemipenis: a survey of basic structure and systematic characteristics. *Zoologica*, 45:17-28.
- Dubois, A., Bauer, A. M., Ceriaco, L. M. P., Dusouler, F., Fretey, T., Lobl, I., Lorvelec, O., Ohler, A., Stopiglia, R. and Aescht, E. 2019. The Linz ZooCode project: a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. First report of activities (2014-2019). *Bionomina*, 17:1-111.
- Duméril, A. M. C., Bibron, G. and Duméril, A. H. A., 1854. *Erpétologie générale ou histoire naturelle complète des reptiles. Tome septième. Deuxième partie, comprenant l'histoire des serpents venimeux*. Librairie Encyclopédique de Roret, Paris, France:i-xii+781-1536.
- Dunn, E. R. 1946. Thomas Barbour, 1884 - 1946. *Copeia* 1946(1):1-3.
- Emmrich, D. 1997. Further remarks on the rare Usambara Forest viper, *Atheris ceratophora*, Werner, 1895. *Mitt. Zool. Mus. Berlin* 73:131-151.
- Engelbrecht, H. M. 2017. The radiation and biogeography of snakes across south-eastern Africa with respect to the evolution of the savanna biome. PhD thesis, Stellenbosch University, South Africa.
- Engelbrecht, H. M., Branch, W. R., Greenbaum, E., Burger, M., Conradie, W. and Tolley, K. A. 2020. African Herald snakes, *Crotaphopeltis*, show population structure for a widespread generalist but deep genetic divergence for forest specialists. *Journal of Zoological Systematics and Evolutionary Research* 2020;00:1-14 (Online).
- Engelbrecht, H. M., Branch, W. R. and Tolley, K. A. 2021. Snakes on an African plain: the radiation of *Crotaphopeltis* and *Philothamnus* into open habitat (Serpentes: Colubridae). *PeerJ* 9:e11728 (PRINO) (Online):18 pp.
- Ernst, R. and Rödel, M. O. 2002. A new *Atheris* species (Serpentes: Viperidae), from Tai National Park, Ivory Coast. *The Herpetological Journal* 12:55-61.
- Ernst, R., Lautenschläger, T., Branquima, M. F. and Hölting, M. 2020. At the edge of extinction: a first herpetological assessment of the proposed Serra do Pingano Rainforest National Park in Uíge Province, northern Angola. *Zoosystematics and Evolution* 96(1):237-262.
- Ferreira, J. B. 1897. Sobre alguns reptis ultimamente enviados á secção zoológica do Museu de Lisboa. *Jornal de Ciências Mathematicas, Physicas e Naturaes*, Lisboa 5(18):111-116.
- Fischer, J. G. 1888. Über zwei neue Schlangen und einen neuen Laubfrosch von Kamerun. *Jahrb. Hamburg. Wiss. Anst.* 5:1-10.
- Fitzinger, L. 1843. *Systema Reptilium. Fasciculus primus: Amblyglossae*. Vindobonae: Braumüller und Seidel, Germany:106 pp.
- Fleck, J. 2003. Bemerkungen zur Haltung und Fütterung von *Atheris hispida* Laurent, 1995. *Elaphe* 11(2):38-42.
- Gemel, R., Gassner, G. and Schweiger, S. 2019. Katalog der Typen der Herpetologischen Sammlung des Naturhistorischen Museums Wien - 2018. *Ann. Naturhist. Mus. Wien*, B 121:33-248.
- Getreuer, W. 2019. *Atheris nitschei*. *Podarcis* 10(2):22.
- Goldberg, S. R., Bursley, C. R., Kusamba, C. and Greenbaum, E. 2021. *Atheris nitschei* (Great Lakes Bush Viper). *Endoparasites. Herpetological Review* 52(3):657.
- Gower, D., Garrett, K. and Stafford, P. 2012. *Snakes*. Firefly Books, Buffalo, NY, USA:144 pp.
- Gray, J. E. 1858. Description of a new genus of Boidae from Old Calabar and a list of West African Reptiles. *Proceedings of the Zoological Society of London* 1858:154-167.
- Greenbaum, E. 2017. *Emerald Labyrinth*. ForeEdge / University Press of New England, xviii+329 pp. [2018].
- Groen, J., Bok, B., Tiemann, L. and Verspui, G. J. 2019. Geographic range extension of the Rough-scaled Bush Viper, *Atheris hispida* (Serpentes: Viperidae) from Uganda, Africa. *Herpetology Notes* 12:241-243.
- Günther, A. 1858. *Catalogue of Colubrine snakes of the British Museum*. London, UK:1-XVI,1-281.
- Günther, A. 1863a. On new species of snakes in the collection of the British Museum. *Annals And Magazine of Natural History* (3)11:20-25.
- Günther, A. 1863b. On *Atheris Burtonii*, a new snake from West Africa. *Annals And Magazine of Natural History* (3)12:239.
- Günther, A. 1864. Report on a collection of reptiles and fishes made by Dr. Kirk in the Zambesi and Nyassa Regions. *Proceedings of the Zoological Society of London* 1864:303-314.
- Günther, A. 1888. Contribution to the knowledge of snakes of tropical Africa. *Annals And Magazine of Natural History* (6)1:322-335.
- Günther, A. 1895. Notice of Reptiles and Batrachians collected in the eastern half of tropical Africa. *Annals And Magazine of Natural History* (6)15:523-529.
- Günther, A. 1896. Report on a collection of reptiles and fishes made by Miss M. H. Kingsley during her travels on the Ogowe River and in Old Calabar. *Annals And Magazine of Natural History* (6)17:261-267.
- Gutsche, A. 2014. Schlange, Spinne und Co. Der Reptilienzoo Happ in Klagenfurt. *Reptilia* Münster, Germany 19(106):64-68.
- Haagner, G. V., Branch, W. R. and Haagner, A. J. F. 2000. Notes on a collection of reptiles from Zambia and adjacent areas of the Democratic Republic of the Congo. *Annals of the Eastern Cape Museum* 1:1-25.
- Hallermann, J. 1998. Annotated catalogue of the type specimens of the herpetological collection in the Zoological Museum of the University of Hamburg. *Mitt. hamb. zool. Mus. Inst* 95:197-223.
- Hallermann, J. 2007. Zur Geschichte der herpetologischen Sammlung des Zoologischen Museums Hamburgs, mit besonderer Berücksichtigung von Dr. Johann Gustav Fischer (1819 - 1889). *Sekretär* 7(1):20-32.
- Hammer, T. A. and Thiele, K. R. 2021. Proposals to amend Articles 51 and 56 and Division III, to allow the rejection of culturally offensive and inappropriate names. *Taxon* 70(6):1392-1394.
- Hallowell, E. 1854. Descriptions of new reptiles from Guinea. *Proceedings of the Academy of Natural Sciences of Philadelphia* 1854:193-194.
- Harrington, S. M., de Haan, S. M., Shapiro, L. and Ruane, S. 2018. Habits and characteristics of arboreal snakes worldwide: arboreality constrains body size but does not affect lineage diversification. *Biological Journal of the Linnean Society* 125(1):61-71.
- Hawkeswood, T. J. 2021. Time to end taxonomic vandalism by Wolfgang Wuster *et al.*: The Snakeman, Raymond Hoser's publications are validly published and his names available according to the ICZN: Objective investigation finds Hoser's taxonomic works as scientific best practice and in every relevant case identifies valid entities. *Calodema* 860:1-59.

- Herrmann, H. W., Joger, U., Lenk, P. and Wink, M. 1999. Morphological and molecular phylogenies of viperines: conflicting evidence? *Kaupia* (Darmstadt) (8):21-30.
- Hirschmann, W. 2008. Mehrjährige Haltung und erfolgreiche Vermehrung der Gehörnten Buschvipere, *Atheris ceratophora* Werner, 1896. *Sauria* 30(3):5-12.
- Hoer, K. 2013. 27 Jahre Terrarianer - eine Zeitreise. *Ophidia* 7(1):25-33.
- Honess, P. E. and Bearder, S. K. 1997. Descriptions of the dwarf galago species of Tanzania. *African Primates* 2:75-79.
- Hörold, R. 2014. Schau dich schlau, Schlangenhalter Beobachtungen zum Trinkverhalten von Schlangen. *Terraria-Elaphe* (6):70-72.
- Hoser, R. T. 2007a. Wells and Wellington - It's time to bury the hatchet. *Calodema* Supplementary Paper 1:1-9.
- Hoser, R. T. 2007b. Call to outlaw the use of Tongs for catching and handling deadly snakes. *Bulletin of the Chicago Herpetological Society* 42(6):92-95.
- Hoser, R. T. 2009. Creationism and contrived science: A review of recent python systematics papers and the resolution of issues of taxonomy and nomenclature. *Australasian Journal of Herpetology* 2:1-34. (3 February).
- Hoser, R. T. 2012a. Exposing a fraud! *Afronaja* Wallach, Wüster and Broadley 2009, is a junior synonym of *Spracklandus* Hoser 2009! *Australasian Journal of Herpetology* 9 (3 April 2012):1-64.
- Hoser, R. T. 2012b. A reassessment of the higher taxonomy of the Viperidae. *Australasian Journal of Herpetology* 10:35-48.
- Hoser, R. T. 2012c. A taxonomic revision of the *Vipera palaestinae* Werner, 1938 species group, with the creation of a new genus and a new subgenus. *Australasian Journal of Herpetology* 11:53-55.
- Hoser, R. T. 2012d. A division of the African Tree Viper genus *Atheris* Cope, 1860 into four subgenera (Serpentes: Viperidae). *Australasian Journal of Herpetology* 12:32-35.
- Hoser, R. T. 2012e. Robust taxonomy and nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.
- Hoser, R. T. 2013a. New tribes and sub-tribes of Vipers and elapid snakes and two new species of snake (Squamata:Serpentes). *Australasian Journal of Herpetology* 17:58-63.
- Hoser, R. T. 2013b. The science of herpetology is built on evidence, ethics, quality publications and strict compliance with the rules of nomenclature. *Australasian Journal of Herpetology* 18:2-79.
- Hoser, R. T. 2013c. African Adders (*Bitis* Gray, 1842), reviewed, including, two new subgenera, five new species of Puff Adder, all formerly *Bitis arietans* (Merrem, 1820) subspecific division of *Bitis caudalis* (Smith, 1839) and division of the Berg Adders *Bitis atropos* (Linnaeus, 1758) (Serpentes: Viperidae: Bitisini). *Australasian Journal of Herpetology* 19:3-24.
- Hoser, R. T. 2013d. A formal five-way division of the Gaboon Viper Species Complex: *Bitis* (*Macrocerastes*) *gabonica* (Duméril, Bibron and Duméril, 1854) and a two-way division of the Nose-horned Viper species complex *Bitis* (*Macrocerastes*) *nasicornis* (Shaw, 1802) (Serpentes:Viperidae:Bitisini). *Australasian Journal of Herpetology* 19:25-31.
- Hoser, R. T. 2013e. A new species of Night Adder (Serpentes: Viperidae) from central Africa. *Australasian Journal of Herpetology* 19:32-35.
- Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.
- Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.
- Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-64.
- Hoser, R. T. 2015d. PRINO (Peer reviewed in name only) journals: When quality control in scientific publications fails. *Australasian Journal of Herpetology* 26:3-64.
- Hoser, R. T. 2015e. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.
- Hoser, R. T. 2015f. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). *Australasian Journal of Herpetology* 27:37-54.
- Hoser, R. T. 2015g. A new taxonomy for the *Vipera latastei* species complex (Serpentes: Viperidae). *Australasian Journal of Herpetology* 30:28-36.
- Hoser, R. T. 2019a. 11 new species, 4 new subspecies and a subgenus of Australian Dragon Lizard in the genus *Tympanocryptis* Peters, 1863, with a warning on the conservation status and long-term survival prospects of some newly named taxa. *Australasian Journal of Herpetology* 39:23-52.
- Hoser, R. T. 2019b. Richard Shine *et al.* (1987), Hinrich Kaiser *et al.* (2013), Jane Melville *et al.* (2018 and 2019): Australian Agamids and how rule breakers, liars, thieves, taxonomic vandals and law breaking copyright infringers are causing reptile species to become extinct. *Australasian Journal of Herpetology* 39:53-63.
- Hoser, R. T. 2022. African viper taxonomy revisited. The classification of Hoser (2013) stands the tests of new technology and time; with a new subgenus and a new species from Southern Africa formally named (Serpentes: Viperidae). *Australasian Journal of Herpetology* 56:57-63.
- Hughes, B. 2013. Snakes of Bénin, West Africa. *Bull. Soc. Herp. France* 144:101-159.
- Hughes, B. 2017. Viperidae: *Atheris hirsuta* Ernst and Rödel, 2001 Bristly Tree Viper - Bristly Tree Viper in Ghana. *African Herp News* (65):34-35.
- Hughes, B. 2018. The Snakes of Dodoma. *African Herp News* (67):8.
- Hughes, B. and Barry, D. H. 1969. The snakes of Ghana: a checklist and key. *Bull. Inst. Franc. Afrique Noire* A, 31:1004-1041.
- Ionides, C. J. P. and Pitman, C. R. S. 1965. Notes on two East-African venomous snake populations: *Echis carinatus pyramidum* (Geoffroy), Egyptian Saw-Scaled Viper and *Vipera hindii* Boulenger, Montane Viper. *J. E. Afr. nat. Hist. Soc. natn. Mus.* 25(2-111):116-121.
- International Commission of Zoological Nomenclature (ICZN) 1991a. Opinion 1634: *Atheris* Cope 1862 (Reptilia, Serpentes): conserved. *Bull. Zool. Nomenclature* 48(1):84.
- International Commission of Zoological Nomenclature (ICZN) 1991b. Decision of the commission. Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 48(4):337-338.
- International Commission of Zoological Nomenclature (ICZN) 2001. Opinion 1970. *Bulletin of Zoological Nomenclature* 58(1):74, (30 March 2001).
- International Commission of Zoological Nomenclature (ICZN) 2012. Amendment of Articles 8, 9, 10, 21 and 78 of the *International Code of Zoological Nomenclature* to expand and refine methods of publication. *Zootaxa* (PRINO) (Online) 3450:1-7.
- International Commission of Zoological Nomenclature (ICZN) 2021. Opinion 2468 (Case 3601) - *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and *Australasian Journal of Herpetology* issues 1-24: confirmation of availability declined; Appendix A (Code of Ethics): not adopted as a

- formal criterion for ruling on Cases. *Bulletin of Zoological Nomenclature* 78 (30 April 2021):42-45.
- Jachan, G. 2010. Pflege und Vermehrung der Usambara-Buschvipere *Atheris ceratophora*. *Reptilia* Münster, Germany:15(83):58-68.
- Jan, G. 1863. *Elenco Sistematico degli Ofidi descritti e disegnati per l'Iconografia Generale*. Milano, A. Lombardi, Italy:vii+143 pp.
- Joger, U. 1982. Zur Herpetofaunistik Kameruns (II). *Bonner Zoologische Beiträge* 33(2-4):313-319.
- Joger, U. and Courage, K. 1999. Are paleartic 'rattlesnakes' (*Echis* and *Cerastes*) monophyletic? *Kaupia* (Darmstadt) (8):65-81.
- Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.
- Kaiser, H. 2012b. Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.
- Kaiser, H. 2013. The Taxon Filter, a novel mechanism designed to facilitate the relationship between taxonomy and nomenclature, vis-à-vis the utility of the Code's Article 81 (the Commission's plenary power). *Bulletin of Zoological Nomenclature* 70(4) December 2013:293-302.
- Kaiser, H. 2014a. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature*, 71(1):30-35.
- Kaiser, H. 2014b. Best Practices in Herpetological Taxonomy: Errata and Addenda. *Herpetological Review*, 45(2):257-268.
- Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.
- Kielgast, J. 2011. *Atheris squamigera* (Hallowell, 1854). *Elaphe* 19(3):64.
- Koetze, J. 2008. De Doelgroep Gifslangen (DGL). *Lacerta* 66(1-3):4-5.
- Kramer, E. 1961. Über zwei afrikanische Zwergpuffottem, *Bitis hindii* (Boulenger, 1910) und *Bitis superciliaris* (Peters, 1854). *Vierteljahr. naturf. Ges. Zürich* 106:419-423.
- Krecksak, L. 2007. An account of the generic and specific names, and type specimens of viperid taxa described by Albert Franz Theodor Reuss (Squamata: Viperidae). *Zootaxa* (PRINO) (Online) 1514:1-36.
- Krecksak, L. and Bohle, D. 2008. The eccentric Adder man: a note on the life and works of Albert Franz Theodor Reuss (1879-1958). *Herpetological Bulletin* 103:1-10.
- Laita, M. 2013. *Serpentine*. Abrams and PQ Blackwell, Auckland, New Zealand:200 unnumbered pages.
- Lanoie, L. O. and Branch, W. R. 1991. Venoms and Snakebite: *Atheris squamiger*. Envenomation. *Journal of the Herpetological Association of Africa* (39):29-29.
- Largen, M. J. and Spawls, S. 2010. *Amphibians and Reptiles of Ethiopia and Eritrea*. Edition Chimaira, Frankfurt, Germany:694 pp.
- Lauer, C. and Hoyer, M. 2019. Almost 1,700 priests and clergy accused of sex abuse are unsupervised. *NBC News* 5 October, online at: <https://www.nbcnews.com/news/religion/nearly-1-700-priests-clergy-accused-sex-abuse-are-unsupervised-n1062396>
- Laurent, R. F. 1955. Diagnoses préliminaires des quelques Serpents venimeux. *Rev. Zool. Bot. Afr.*, 51:127-139.
- Laurent, R. F. 1956. Contribution à l'herpétologie de la région des Grandes Lacs de l'Afrique centrale. *Ann. Mus. Roy. Congo Belge* (Sci. Zool.), 48:1-390.
- Laurent, R. F. 1958. Notes herpétologiques africaines II. *Rev. Zool. Bot. Afr.*, 58(1-2):115-128.
- Laurenti, J. N. 1768. *Specimen medicum, exhibens synopsis reptilium emendatam cum experimentis circa venena et antidota reptilium austracorum, quod auctoritate et consensu*. Vienna, Joan. Thomae:217 pp.
- Lawson, D. P. 1999. A new species of arboreal viper (Serpentes: Viperidae: *Atheris*) from Cameroon, Africa. *Proceedings of the Biological Society of Washington* 112(4):793-803.
- Lawson, D. P. and Ustach, P. C. 2000. A redescription of *Atheris squamigera* (Serpentes: Viperidae) with comments on the validity of *Atheris anisolepis*. *Journal of Herpetology* 34(3):386-389.
- Lawson, D. P., Noonan, B. P. and Ustach, P. C. 2001. *Atheris subocularis* (Serpentes: Viperidae) revisited: molecular and morphological evidence for the resurrection of an enigmatic taxon. *Copeia* 2001(3):737-744.
- Leaché, A. D., Rödel, M., Linkem, C. W., Diaz, R. E., Hillers, A. and Fujita, M. K. 2006. Biodiversity in a forest island: reptiles and amphibians of the Togo Hills, Kyabobo National Park, Ghana. *Amphibian and Reptile Conservation* 4(1):22-45.
- Lebreton, M. 1999. *A working checklist of the herpetofauna of Cameroon*. Netherlands Committee for IUCN:160 pp.
- Lenk, P., Kalyabina, S., Wink, M. and Joger, U. 2001. Evolutionary relationships among the true vipers (Reptilia: Viperidae) inferred from mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution* 19(1):94-104.
- Lillywhite, H. B. 2014. *How Snakes Work: Structure, Function and Behavior of the World's Snakes*. Oxford University Press, New York, USA:256 pp.
- LiVigni, F. (ed.) 2013. *A Life for Reptiles and Amphibians*, Volume 1. Chimaira, Frankfurt, Germany:495 pp.
- Love, B. 2017. Action zeigen - ohne Fotos. *Reptilia* Münster, Germany:22(128):60-61.
- Loveridge, A. 1929. East African reptiles and amphibians in the United States National Museum. *Bull. US Natl. Mus.* (151):1-135.
- Loveridge, A. 1930. Preliminary description of a new tree viper of the genus *Atheris* from Tanganyika Territory. *Proceedings of the New England Zoological Club* 11:107-108.
- Loveridge, A. 1932. New opisthophyphous snakes of the genera *Crotaphopeltis* and *Trimerorhinus* from Angola and Kenya Colony. *Proceedings of the Biological Society of Washington* 45:83-86.
- Loveridge, A. 1933. Reports on the scientific Results of an Expedition to the Southwestern Highlands of Tanganyika Territory. VII. Herpetology. *Bulletin of the Museum of Comparative Zoology Harvard* 74:197-415.
- Loveridge, A. 1936. African reptiles and amphibians in the Field Museum of Natural History. *Zoological Series, Field Museum of Natural History*, Chicago, 22(1):1-122.
- Loveridge, A. 1938a. On a collection of reptiles and amphibians from Liberia. *Proceedings of the New England Zoological Club* 17:49-74.
- Loveridge, A. 1938b. Zoological results of the George Vanderbilt African expedition of 1934. VII. Reptiles and amphibians. *Proceedings of the Academy of Natural Sciences of Philadelphia* 89 [1937]:265-296.
- Loveridge, A. 1946. Thomas Barbour, Herpetologist: 1884-1946. *Herpetologica* 3(2):33-39.
- Loveridge, A. 1957a. On a third collection of reptiles taken in Tanganyika by C. J. P. Ionides, Esq. *Tanganyika Notes and Records* 43:1-19.
- Loveridge, A. 1957b. Check list of the reptiles and amphibians of East Africa (Uganda; Kenya; Tanganyika; Zanzibar). *Bulletin of the Museum of Comparative Zoology Harvard* 117:151-362+i-xxxvi.
- Lyakurwa, J. V. 2017. The Reptiles of the Uzungwa Scarp Forest Reserve (USFR): An Updated Checklist with Notes on Dagger-Tooth Vine Snake *Xyelodontophis uluguruensis*. *Journal of East African Natural History* 106(2):57-65.
- Lyakurwa, J. V., Howell, K. M., Munishi, L. K. and Treydte, A. C. 2019. Uzungwa Scarp Nature Forest Reserve; a unique hotspot for reptiles in Tanzania. *Acta Herpetologica* 14(1):3-14.
- Mallow, D., Ludwig, D. and Nilson, G. 2003. *True Vipers: Natural History and Toxinology of Old World Vipers*. Krieger, Malabar, Florida, USA:410 pp.

- Malonza, P. K., Wasonga, V. D., Muchai, V., Rotich, D., Bwong, B. A. and Bauer, A. M. 2006. Diversity and biogeography of herpetofauna of the Tana River Primate National Reserve, Kenya. *Journal of East African Natural History* 95(2):95-109.
- Malonza, P. K., Mulwa, D. M., Nyamache, J. O. and Jones, G. 2017. Biogeography of the Shimba Hills ecosystem herpetofauna in Kenya. *Zoological Research* 38(5):1-11.
- Maritz, B., Penner, J., Martins, M., Crnobrnja-Isailović, J., Spear, S., Alencar, L. R. N., Sigala-Rodriguez, J., Messenger, K., Clark, R. W., Soorae, P., Luiselli, L., Jenkins, C. and Greene, H. W. 2016. Identifying global priorities for the conservation of vipers. *Biological Conservation*, 204:92-102.
- Marques, M. P., Ceriaco, L. M. P., Blackburn, D. C. and Bauer, A. M. 2018. Diversity and Distribution of the Amphibians and Terrestrial Reptiles of Angola - Atlas of Historical and Bibliographic Records (1840-2017). *Proceedings of the California Academy of Sciences* (Ser. 4) 65:1-501 (Supplement II).
- Marshall, B. M. and Strine, C. T. 2019. Exploring snake occurrence records: Spatial biases and marginal gains from accessible social media. PeerJ 7:e8059 (PRINO) (Online) at: <https://peerj.com/articles/8059/>
- Marx, H. and Rabb, G. B. 1965. Relationships and zoogeography of the viperine snakes (Family Viperidae). *Fieldiana: Zoology* 44(21):161-206.
- Masters, J. C., Fabien G. S., Couette, C. P., Groves, S. D., Nash, M. D. and Pozzi, L. 2017. A new genus for the eastern dwarf galagos (Primates: Galagidae). *Zoological Journal of the Linnean Society*, 181:229-241.
- Mattison, C. 1995. *The Encyclopedia of Snakes*. Facts on File, New York, USA:256 pp.
- Mattison, C. 2007. *The New Encyclopedia of Snakes*. Princeton University Press, USA:272 pp.
- McDiarmid, R. W., Campbell, J. A. and Touré, T. A. 1999. *Snake species of the world*. Vol. 1. Herpetologists' League, USA:511 pp.
- Meeke, S. E. and Cory, C. B. 1910. Batrachians and reptiles from British East Africa. *Publication of the Field Museum of Natural History* 7(11):403-414.
- Meidinger, R. 1998. Erstrnachzucht von *Atheris desaixi* Ashe, 1968, Mount-Kenya-Buschviper. *Elaphe* 6(3):15-17.
- Meidinger, R. 2000. Erfolgreiche Haltung und Erstrnachzucht von *Atheris hispidus*, der Rauhschuppigen Buschviper. *Elaphe* 8(4):5-10.
- Menegon, M., Doggart, N. and Owen, N. 2008. The Nguru mountains of Tanzania, an outstanding hotspot of herpetofaunal diversity. *Acta Herpetologica* 3(2):107-127.
- Menegon, M., Davenport, T. R. B. and Howell, K. M. 2011. Description of a new and critically endangered species of *Atheris* (Serpentes: Viperidae) from the Southern Highlands of Tanzania, with an overview of the country's tree viper fauna. *Zootaxa* (PRINO) (Online) 3120:43-54.
- Menegon, M., Loader, S. P., Marsden, S. J., Branch, W. R., Davenport, T. R. B. and Ursenbacher, S. 2014. The genus *Atheris* (Serpentes: Viperidae) in East Africa: Phylogeny and the role of rifting and climate in shaping the current pattern of species diversity. *Molecular Phylogenetics and Evolution* 79:12-22.
- Menzies, J. I. 1966. The snakes of Sierra Leone. *Copeia* 1966(2):169-179.
- Mertens, R. 1965. Die Reptilien von Fernando Po. *Bonner Zoologische Beiträge* 15:211-238 [1964].
- Meshack, C. 2009. CEPF Final Project Completion Report, March, 6 pp. Online at: https://www.cepf.net/sites/default/files/final_tfcg_restoring_forests.pdf
- Milde, R. 2019. Da ist doch was im Busch - die Grüne Buschviper (*Atheris squamigera*) im Terrarium. *Reptilia*, Münster, Germany:24(137):44-47.
- Mitchell, F. J. 1948. A revision of the lacertilian genus *Tympanocryptis*. *Records of the South Australian Museum* 9:57-86.
- Mocquard, M. F. 1887. Sur les ophiidiens rapportés du Congo par la Mission de Brazza. *Bull. Soc. Philomath.* Paris, France (7)11:62-92.
- Monard, A. 1931. Mission scientifique Suisse dans l'Angola. Résultats scientifiques. Reptiles. *Bull. Soc. Neuchâtel Sci. Nat.*, 33:89-111.
- Monard, A. 1940. Résultats de la mission du Dr. Monard en Guinée Portugaise 1937-1938. *Arq. Mus. Bocage*, Lisbon 11:147-182.
- Mocquard, M. F. 1887. Sur les ophiidiens rapportés du Congo par la Mission de Brazza. *Bull. Soc. Philomath.* Paris (7)11:62-92.
- Monzel, M. M. 2012. Gifte, Gifttiere, Menschen - eine Geschichte voller (Miss)Verständnisse. *Draco* 13(51):4-25.
- Mosyakin, S. L. 2022. If "Rhodes-" must fall, who shall fall next? *Taxon* 71:49-255.
- Muchai, V. and Malonza, P. 2011. The reptiles and amphibians of Kibwezi Forest, Ngulia and Chyulu Hills. *Kenya Past and Present* (39):45-49.
- Müller, L. 1910. Beiträge zur Herpetologie Kameruns. *Abh. Bayer. K. Akad. Wiss.* 2, 24(3):545-626.
- Ota, H. and Hikida, T. 1987. On a small collection of lizards and snakes from Cameroon, West Africa. *African Study Monographs* 8(2):111-123.
- Pauwels, O. S. G. and Brecko, J. 2020. Book Review: Snakes of Central and Western Africa. *Herpetological Review* 51:161-164.
- Pauwels, O. S. G. and Colyn, M. 2023. On a Diverse Collection of Snakes from Amadjabe, Left Bank of the Congo River, Northeastern Democratic Republic of the Congo. *Bulletin of the Chicago Herpetological Society* 58(3):34-47.
- Pauwels, O. S. G. and David, P. 2008. Miscellanea Herpetologica Gabonica II. *Hamadryad* 32(1):19-24.
- Pauwels, O. S. G. and Vande Weghe, J. P. 2008. *Les reptiles du Gabon*. Smithsonian Institution, Washington:272 pp.
- Pauwels, O. S. G., Kamdem Toham, A. and Chimsunchart, C. 2002. Recherches sur l'herpétofaune du Massif du Chaillu, Gabon. *Bull. Inst. Roy. Sci. Nat. Belgique* (Biologie) 72:47-57.
- Pauwels, O. S. G., Le Garff, B., Ineich, I., Carlino, P., Melcore, I., Boundenga, L., Vigna, C., Stévant, T., Jeffery, K., Orbell, C., Squarcini, J. -B., Vande weghe, J. P. and White, L. J. T. 2016. Miscellanea Herpetologica Gabonica V and VI. *Bulletin of the Chicago Herpetological Society* 51:177.
- Pauwels, O. S. G., Morelle, S., Albert, J. -L., Carlino, P., Rahola, N. and Trape, J. -F. 2019. New reptile records from Lékédi Park and Haut-Ogooué Province, southeastern Gabon. *Amphibian and Reptile Conservation* 13(1) [General Section]:143-161.
- Pauwels, O. S. G., Chirio, L. and Dekoninck, W. 2022. Diet records for snakes from Guinea, West Africa. *Bulletin of the Chicago Herpetological Society* 57(6):117-123.
- Pel, H. S. 1852. Over de jagt aan de Goudkust, volgens eene tienjarige eigene ondervinding. *Ned. Tijdschr. Jagtkunde*. 1:149-173.
- Penner, J., GonWouo, L. N. and Rödel, M. -O. 2013. Second record of the West African hairy bush viper *Atheris hirsuta* Ernst and Rödel, 2002 (Serpentes: Viperidae). *Zootaxa* (PRINO) (Online) 3694(2):196-200.
- Perret, J. L. 1961. Études herpétologiques africaines III. 1. La faune ophiidienne de la région camerounaise. *Bull. Soc. neuchâtel. Sci. nat.*, 84:133-138.
- Perret, J. L. and Mertens, R. 1957. Étude d'une collection herpétologique faile au Cameroun de 1952 à 1955. *Bulletin de l'Institut Français d'Afrique Noire* (A)19(2):548-601.
- Peters, W. C. H. 1854. Diagnosen neuer Batrachier, welche zusammen mit der früher (24. Juli und 17. August) gegebenen Übersicht der Schlangen und Eidechsen mitgetheilt werden. *Ber. Bekanntmach. Geeignet. Königl. Preuss. Akademie der Wissenschaften zu Berlin* 1854:614-628.
- Peters, W. C. H. 1863. Eine Übersicht der von Hrn. Richard Schomburgk an das zoologische Museum eingesandten Amphibien, aus Buchsfelde bei Adelaide in Südastralien. *Monatsberichte der Königlichen Preussische Akademie des*

- Wissenschaften zu Berlin* 1863 (April):228-236.
- Peters, W. C. H. 1864. Eine neue Art der Baumvipern, *Atheris polylepis*, aus Liberia. *Monatsberichte der Königlichen Preussische Akademie des Wissenschaften zu Berlin* 1864 (November):642-664.
- Pfeffer, G. 1893. Ostafrikanische Reptilien und Amphibien, gesammelt von Herrn Dr. F. Stuhlmann im Jahre 1888 und 1889. *Jb. Hamb. Wiss. Anst.* 10:71-105.
- Phelps, T. 2010. *Old World Vipers*. Edition Chimaira, Frankfurt, Germany:558 pp.
- Pietersen, D., Verburgt, L. and Davies, J. 2021. *Snakes and other reptiles of Zambia and Malawi*. Struik Nature / Penguin / Random House, South Africa:376 pp.
- Pitman, C. R. S. 1974. *A guide to the snakes of Uganda*. Codicote, Wheldon and Wesley, L., UK:290 pp.
- Portik, D. M., Jongsma, G. F. M., Kouete, M. T., Scheinberg, L. A., Freiermuth, B., Tapondjou, W. P. and Blackburn, D. C. 2016. A survey of amphibians and reptiles in the foothills of Mount Kupe, Cameroon. *Amphibian and Reptile Conservation* 10(2) [Special Section]:37-67.
- Pyron, R. A., Burbrink, F. T. and Weins, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evol. Biol.* 13, 93. Published online at: <http://www.biomedcentral.com/1471-2148/13/93>.
- Rasmussen, J. B. 1981. The snakes from the rainforest of the Usambara Mountains, Tanzania: a checklist and key. *Salamandra* 17(3-4):173-188.
- Rasmussen, J. B. 1985. A new species of *Crotaphopeltis* from east Africa, with remarks on the identity of *Dipsas hippocrepsis* Reinhardt, 1843 (Serpentes: Boiginae). *Steenstrupia* 11(4):113-129.
- Rasmussen, J. B. 1986. On the taxonomic status of *Dipsadoboa wernerii* (Boulenger), *D. shrevei* (Loveridge), and *Crotaphopeltis hotamboiea kageleri* Uthmüller (Boiginae, Serpentes). *Amphibia-Reptilia* 7:51-73.
- Rasmussen, J. B. 1989a. A taxonomic review of the *Dipsadoboa duchesnei* complex. *Bonner Zoologische Beiträge* 40(3/4):249-264.
- Rasmussen, J. B. 1989b. On the taxonomic status of *Dipsadoboa aulica aulica* Günther and *D. aulica flavida* Broadley and Stevens, with the description of a new subspecies of *D. flavida* Broadley and Stevens (Boiginae, Serpentes). *Amphibia-Reptilia* 10:35-62.
- Rasmussen, J. B. 1993a. The current taxonomic status of Tornier's cat-snake (*Crotaphopeltis tornieri*). *Amphibia-Reptilia* 14:395-409.
- Rasmussen, J. B. 1993b. A taxonomic review of the *Dipsadoboa unicolor* complex, including a phylogenetic analysis of the genus (Serpentes, Dipsadidae, Boiginae). *Steenstrupia* 19(4):129-196.
- Rasmussen, J. B. 1997. On two little-known African water snakes (*Crotaphopeltis degeni* and *Crotaphopeltis barotseensis*). *Amphibia-Reptilia* 18:191-206.
- Rasmussen, J. B. and Howell, K. M. 1982. The current status of the rare Usambara mountain forest-viper, *Atheris ceratophorus* Werner, 1895, including a probable new record of *Atheris nitschei rungweensis* Bogert, 1940, and a discussion of its validity (Reptilia, Serpentes, Viperidae). *Amphibia-Reptilia* 3:269-277.
- Rasmussen, J. B. and Howell, K. M. 1999. A review of Barbour's short-headed viper, *Adenorhinos barbouri* (Serpentes: Viperidae). *African Journal of Herpetology* 47(2):69-75 [1998].
- Razzetti, E. and Msuya, C. A. 2002. *Field guide to the amphibians and reptiles of Arusha National Park (Tanzania)*. Publ. Ed. Negri Istituto, Oikos, Varese:84 pp.
- Reuss, F. A. T. 1939. Berichtigungen und Ergänzungen zu meinen Arbeiten über Toxicophidier, 1938. *ZATV* 1.13-14.
- Rhodin, A. et al. (70 listed authors, with some later publishing that they had never read the document they allegedly co-authored) 2015. Comment on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; 71: 30-38, 133-135, 181-182, 252-253). *Bulletin of Zoological Nomenclature* 72(1):65-78.
- Ride, W. D. L. (ed.) et al. (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature*. The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").
- Robertson, I. A. D., Chapman, B. M. and Chapman, N. F. 1963. Notes on some reptiles collected in the Rukwa Valley, S. W. Tanganyika. *Annals And Magazine of Natural History Ser.* 13, 5(55):421-432.
- Rochebrune, A. T. de 1885. Vertébratenum novorum vel minus cognitorum orae Africae occidentalis in colarum. *Bull. Soc. philom. Paris* 9:86-99.
- Roelke, C. E. and Smith, E. N. 2010. Herpetofauna, Parc National des Volcans, North Province, Republic of Rwanda. *Check List* 6(4):525-531.
- Rovero, F., Menegon, M., Fjeldså, J., Collett, L., Doggart, N., Leonard, C., Norton, G., Owen, N., Perkin, A., Spitale, D., Ahrends, A. and Burgess, N. D. 2014. Targeted vertebrate surveys enhance the faunal importance and improve explanatory models within the Eastern Arc Mountains of Kenya and Tanzania. *Diversity and Distributions* 20(12):1438-1449.
- Sanchez-Vialas, I., Calvo-Revuelta, M. and De La Riva, I. 2022. Synopsis of the terrestrial Reptiles of Equatorial Guinea. *Zootaxa* (PRINO) (Online), 5202(1):1-197.
- Santos, B. S., Marques, M. P., Bauer, A. M. and Ceriaco, L. M. P. 2021. Herpetological results of Francisco Newton's Zoological Expedition to Angola (1903-1906): a taxonomic revision and new records of a forgotten collection. *Zootaxa* (PRINO) (Online) 5028(1):1-80.
- Schlegel, H. 1855. Over eenige nieuwe soorten van vergiftige slangen van de Goudkust. Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen Amsterdam, (Afdeling Natuurkunde), 3:312-317.
- Schlüter, A. and Hallermann, J. 1997. The Type Specimens in the Herpetological Collection of the Staatliches Museum für Naturkunde in Stuttgart. *Stuttgarter Beitr. Naturk. Ser. A* (553):1-15.
- Schmidt, D. and Kunz, K. 2005. *Ernährung von Schlangen*. Natur und Tier Verlag, Münster, Germany:159 pp.
- Schmidt, K. P. 1923. Contributions to the herpetology of the Belgian Congo based on the collection of the American Museum Congo Expedition, 1909-1915. Part II. Snakes, with field notes by Herbert Lang and James P. Chapin. *Bulletin of the American Museum of Natural History* 49(1):1-146.
- Segniagbeto, G., Lazcano, H., Trape, J. F., David, P., Ohler, A., Dubois, A. and Glietho I. A. 2011. The snake fauna of Togo: systematics, distribution and biogeography, with remarks on selected taxonomic problems. *Zoosystema* 33(3):325-360.
- Segniagbeto, G. H., Dekawole, J. K., Ketoh, G. K., Dendi, D. and Luiselli, L. 2022. Herpetofaunal Diversity in a Dahomey Gap Savannah of Togo (West Africa): Effects of Seasons on the Populations of Amphibians and Reptiles. *Diversity* 14:964:15 pp.
- Senter, P. J. and Chippaux, J. P. 2022. Biogeography of snakes in Liberia: Review and synthesis of current knowledge. *Ghana Journal of Science* 63(1):29-62.
- Šmid, J. and Tolley, K. A. 2019. Calibrating the tree of vipers under the fossilized birth-death model. *Scientific Reports* 9:5510.
- Spawls, S. 1990. Further comments on *Atheris*. *British Herpetological Society Bulletin* 34:44-45.
- Spawls, S. and Branch, B. 1995. *The Dangerous Snakes of Africa*. Blandford, London, UK:192 pp.
- Spawls, S., Howell, K., Hinkel, H. and Menegon, M. 2011. *Field Guide to East African Reptiles*. Bloomsbury, UK:543 pp.
- Spawls, S., Howell, K., Hinkel, H. and Menegon, M. 2018. *Field Guide to East African Reptiles*. Bloomsbury, UK:624 pp.
- Spranger, T. M. 2012. Haltung und Handel „exotischer“ Tiere als Gegenstand des Polizei- und Ordnungsrechts. *Draco* 13(51):44-53.

- Sternfeld, R. 1908. Die Schlangenfauna von Kamerun. *Mitt. zool. Mus. Berlin* 3(4):397-432.
- Sternfeld, R. 1917. Reptilia und Amphibia. in: Schubotz, H. (Hrsg.): Wissenschaftliche Ergebnisse der Zweiten Deutschen Zentral-Afrika-Expedition, 1910-1911 unter Führung Adolph Friedrichs, Herzog zu Mecklenburg. Leipzig: Klinkhardt und Biermann, [Band] 1, *Zoologie, Lieferung* 11:407-510.
- Stevens, R. A. 1973. A report on the lowland viper, *Antheris superciliaris* (Peters), from the Lake Chilwa Floodplain of Malawi. *Arnoldia* 6(22):1-22.
- Sweeney, R. C. H. 1963. Two uncommonly seen snakes in Nyasaland. *The Nyasaland Journal* 16(1):71-72.
- Thiele, K. R., Oliver, P. M., Bauer, A. M., Doughty, P., Kraus, F., Rix, M. G., Kaiser, H. 2020. Case 3824 - A special proposal to suppress certain names under the plenary powers of the Commission. *Bulletin of Zoological Nomenclature* 77:78 (title only). The full submission to the ICZN was sent out as a SPAM email to thousands of recipients, is a rambling 71 page pdf and is widely available online.
- Timberlake, J. R., Bayliss, J., Dowsett-Lemaire, F., Conghan, C., Branch, W. R., Collins, S., Curran, M., Dowsett, R. J., Fishpool, L., Francisco, J., Harris, T., Kopp, M. and De Sousa, C. 2012. *Mt Mabui, Mozambique: Biodiversity and Conservation*. Report produced under the Darwin Initiative Award 15/036. Royal Botanic Gardens, Kew, London, UK:94 pp.
- Tornier, G. 1902. Herpetologisch Neues aus Deutsch-Ostafrika. *Zool. Jahrbücher für Systematik* 15:578-590.
- Trape, J. -F. and Balde, C. 2014. A checklist of the snake fauna of Guinea, with taxonomic changes in the genera *Philothamnus* and *Dipsadoboa* (Colubridae) and a comparison with the snake fauna of some other West African countries. *Zootaxa* (PRINO) (Online) 3900(3):301-338.
- Trape, J. -F. and Collet, M. 2021. Nouvelles données sur les serpents du sud-est du Katanga. *Bull. Société herpétologique de France* 179:11-26.
- Trape, J. -F. and Mané, Y. 2000. Les serpents des environs de Dielmo (Sine-Saloum, Sénégal). *Bull. Soc. Herp. France* 95:19-35.
- Trape, J. -F. and Mané, Y. 2004. Les serpents des environs de Bandafassi (Sénégal oriental). *Bull. Société herpétologique de France* 109:5-34.
- Trape, J. -F. and Mané, Y. 2006. *Guide des serpents d'Afrique occidentale. Savane et désert*. [Senegal, Gambia, Mauritania, Mali, Burkina Faso, Niger]. IRD Editions, Paris, France:226 pp.
- Trape, J. -F. and Mané, Y. 2015. The snakes of Niger. *Amphibian and Reptile Conservation* 9(2):39-55 (e110) (online).
- Trape, J. -F. and Mané, Y. 2017. The snakes of Mali. *Bonn zoological Bulletin* 66(2):107-133.
- Trape, J. -F. and Roux-Esteve, R. 1995. Les serpents du Congo: liste commentée et clé de détermination. *Journal of African Zoology* 109(1):31-50.
- Ullrich, K. and Böhme, W. 2017. Six new records of Afrotropical lizard and snake species (Reptilia: Squamata) from the Republic of South Sudan. *Bonn zoological Bulletin* 66(2):139-144.
- Wagner, P. 2018. Erstnachweis von *Atheris katangensis* de Witte, 1953 außerhalb ihrer Typuslokalität. *Sauria* 40(3):67-70.
- Wallach, V. 2019. Envenomation effects of a snakebite by the Great Lakes Bushviper, *Atheris nitschei* Tornier, 1902, from Kivu, Zaire in April 1981, with notes on its venom and other bites. *Podarcis* 10(2):39-50.
- Wallach, V., Williams, K. L. and Boundy, J. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. Taylor and Francis, CRC Press, USA/UK:1237 pp.
- Wellington, R. W. 2015. Comment on the proposed confirmation of the availability of the generic name *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature* 72(3):222-226.
- Werner, F. 1895. Über einige Reptilien aus Usambara (Deutsch-Ostafrika). *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, 45:190-194.
- Werning, H. and Wolf, C. 2007. Gebirge und Hochland - Reptilien und Amphibien in einem extremen Lebensraum. *Draco* 7(27):4-27.
- Wirth, M. 2011. Terrarienschauanlagen Das Paradies der Ungeliebten - der Reptilienzoo Scheidegg. *Reptilia* Münster, Germany:16(88):80.
- Witte, G. F. de 1933. Reptiles récoltés au Congo Belge par le Dr. H. Schouteden et par M. G.-F. Witte. *Ann. Mus. Congo belge Zool. Ser. 1 Tome III*:53-100.
- Witte, G. F. de 1953. *Reptiles. Exploration du Parc National de l'Upemba. Mission G. F. de Witte en collaboration avec W. Adam, A. Janssens, L. Van Meel et R. Verheyen (1946-1949)*. Institut des Parcs Nationaux du Congo Belge. Brussels, 6:322 pp.
- Wustrack, F. 2002. Erfolgreiche Nachzucht der Schwarzgrünen Buschviper, *Atheris nitschei* (Tornier, 1902). *Elaphe* 10(1):42-48.
- Zassi-Boulou, A. G., Tchimbakala, J. G., Mavoungou, L. B. and Jackson, K. 2020. A Survey of Snakes in the Patte d'Oie Forest Reserve (Brazzaville, Republic of Congo): an Urban Snake Community in Central Africa. *Herpetological Conservation and Biology*, 15(1):139-149.

CONFLICT OF INTEREST

None.

Australasian Journal of Herpetology®

Publishes original research in printed form in relation to reptiles, other fauna and related matters in a peer reviewed journal for permanent public scientific record, and has a global audience.

In more than a decade it has established itself as Australia's leading, high impact scientific journal in relation to reptiles and otherfauna.

Full details at: <http://www.herp.net>

Online journals (this issue) appear a month after hard copy publication.

Minimum print run of first printings is always at least fifty hard copies.

**Proudly Supported by Snakebusters:
Australia's best reptiles.**

Snakebusters: Australia's only hands-on reptiles shows!



Three new species of Kraits in the *Bungarus fasciatus* (Schneider, 1801) species complex.

LSIDURN:LSID:ZOOBANK.ORG:PUB:51E9ABB9-CC2F-45EA-931A-01B3E640D60A

RAYMOND T. HOSER

LSID urn:lsid:zoobank.org:author:F9D74EB5-CFB5-49A0-8C7C-9F993B8504AE

488 Park Road, Park Orchards, Victoria, 3134, Australia.

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: snakeman (at) snakeman.com.au

Received 20 January 2023, Accepted 18 February 2023, Published 25 May 2023.

ABSTRACT

Scrutiny of specimens of putative Krait species within the *Bungarus fasciatus* (Schneider, 1801) species complex in the past four years has confirmed the recognition of three relevant species as previously recognised by Hoser (2018) (then as subspecies), being *Bungarus fasciatus* (Schneider, 1801), with a type locality of Bengal, India, *Bungarus bifasciatus* (Mell, 1929), with a type locality of southern Kwangsi, south-east China and *Bungarus insularis* (Mell, 1930) from "The Malay Archipelago", being of the form found primarily in Java, but also occurring in nearby Sumatra, Bali and southern Borneo.

Inspection of specimens of putative *B. bifasciatus* from central and southern Thailand, and the Mekong drainage to the east, showed consistent morphological divergences from those from south-east China and north Vietnam, indicating species level divergence of these populations from both *B. bifasciatus*, the other two named forms in the complex and each other.

A study by Biakzuala *et al.* (2023), agreed with the findings of Hoser (2018) in recognizing the three species in the *Bungarus fasciatus* complex with available names, but at the species level, however mistakenly believing that the two forms previously named by Rudolf Emil Mell were unnamed.

They also implied species-level divergence for one or more populations within their so-called Clade 3, representing mainly Chinese animals.

On the basis of the preceding facts, including distributional disjunction between the relevant forms, as well as consistent morphological divergence, the southern Thailand population and that of the Mekong drainage are formally described according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) as the new species, *Bungarus crotalusei* sp. nov. and *B. daranini* sp. nov.. *Bungarus crotalusei* sp. nov. appears to be split into two divergent populations, with those specimens south of the Isthmus of Kra to Singapore formally assigned to the subspecies *Bungarus crotalusei peninsularensis* subsp. nov..

Specimens from north Sarawak, Borneo, are also clearly divergent from all others, although morphologically most similar to those of type *B. insularis*. They are biogeographically isolated from all other populations and so are also formally named as a new species, *B. oxyi* sp. nov..

Keywords: Taxonomy; nomenclature, reptile; snake; elapid; Krait; *Bungarus*; *fasciatus*; *bifasciatus*; *insularis*; Asia; Thailand; Malaysia; Indonesia; India; China; Guangxi; Burma; Laos; Vietnam; Myanmar; Siam; Malay Peninsula; Borneo, Mekong; Chao Phraya; Sarawak; new species; *crotalusei*; *daranini*; *oxyi*; new subspecies; *peninsularensis*.

INTRODUCTION

The iconic Kraits of south-east Asia are known to herpetologists globally. Locally common and studied extensively, Hoser (2018) published a review of the genus *Bungarus* Daudin, 1803 *sensu lato* splitting the genus four-ways and resurrecting from synonymy available names for each. One species and two subspecies were also formally named for the first time.

Bungarus sensu stricto, only included the putative species *Pseudoboia fasciata* Schneider, 1801, with a type locality of

Bengal, India, which Hoser formally divided into three subspecies, using the names previously proposed by Rudolf Emil Mell in 1929/1930, for the other relevant subspecies.

These were *Bungarus fasciatus bifasciatus* Mell, 1929, with a type locality of Kwangsi, southern China and *Bungarus fasciatus insularis* Mell, 1930 from "The Malay Archipelago" (being of the Javanese form).

The three named forms and their type localities, effectively also pointed to the extreme points in the west, east and south for the

distribution of species complex in east and south-east Asia, this being the eastern Indian subcontinent in the west, southern China in the north-east and the Malay Archipelago (Indonesia) in the south-east.

A study by Biakzuala *et al.* (2023), agreed with the findings of Hoser (2018) in recognizing the three species in the *Bungarus fasciatus* complex with available names, but at the species level, however mistakenly believing that the two forms previously named by Mell were unnamed.

They also implied species-level divergence of some populations within nominate *B. bifasciatus* (their Clade 3) from China, Vietnam, and Thailand but gave no evidence of either distributional disjuncture or morphological divergence of this general population.

Separate studies by myself over the four years since the publication of Hoser (2018) also corroborates the taxonomic position of Biakzuala *et al.* (2023), viz, elevation of the three previously named subspecies to full and separate species, but has gone further in determining the distributions of various forms of putative *Bungarus bifasciatus* (Mell, 1929) in China, Vietnam, Laos, Cambodia and Thailand, and confirmed that there are in fact three two allopatric species, based on consistent morphological divergence and allopatric distributions.

These also appear to match the main drainage basins in the region, coupled with high elevation mountain barriers sufficient to constrain each population.

Inspection of specimens of putative *B. bifasciatus* from the central Thailand basin and southern Thailand on the upper Malay Peninsula (near the Gulf of Thailand), showed consistent morphological divergence from those from China and Vietnam (Mekong drainage and north, including relevant parts of north-east Thailand), indicating species level divergence of this population from both *B. bifasciatus* and the others in the complex.

In turn those of the Mekong drainage, running from Yunnan, China, south through Myanmar (Burma), Laos, Thailand, Cambodia and Vietnam, appear divergent from both the south-east Chinese animals (including specimens from nearby north Vietnam), and those from the central Thai lowlands.

The divergent taxa (all five) appear to match the main drainage basins of south-east Asia, noting the relevant basins are best seen in the Ice-age maps of Voris (2000).

Putative *B. insularis* matches the drainages emptying relevant parts of Java, Sumatra, south-western Borneo and putative *B. fasciatus*, matches the main north-south drainages of north Eastern India and Myanmar.

On the basis of the preceding facts, the main Thailand population, of the Chao Phraya drainage basin is formally described according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) as a new species, *Bungarus crotalusei sp. nov.*

Bungarus crotalusei sp. nov. appears to be split into two divergent populations, with those specimens south of the Isthmus of Kra to Singapore formally assigned to the subspecies *Bungarus crotalusei peninsularenensis subsp. nov.*

The divergent Mekong drainage population is formally named *B. daranini sp. nov.*

Furthermore, inspection of specimens from north Borneo, mainly in the Limbang and Baram River drainages of Sarawak, also were clearly divergent from all others.

While morphologically most similar to those of type *B. insularis*, they have significantly wider yellow bands on the dorsum, relative to the alternating black ones and dark upper edges of the upper labials, versus white in *B. insularis*.

Based on Ice-age drainages as shown by Voris (2000), these snakes are biogeographically isolated from all other populations and so are also formally named as a new species, *B. oxyi sp. nov.*

MATERIALS AND METHODS

Live, dead, and photos of specimens within the putative *Bungarus fasciatus* complex were inspected from almost all parts of the known distribution, including India, Bangladesh, Burma, Thailand, Laos, Cambodia, Thailand, China, Malaysia (both sides), Singapore and Indonesia (including Java, eastern Sumatra, southern and northern Borneo, including Sarawak, Malaysia),

with the specific view of determining any consistent differences between populations.

Specimens from Bhutan, Brunei and Nepal were not inspected, although ones from immediately proximal locations were.

Known distributions were assessed, based on specimen data with good and accurate locality data (mainly using Museum accessions and specimens photographed in the wild and posted online on photo sharing sites such as "flickr.com" and "inaturalist.org"), and attempting to screen out specimens or data potentially translocated by people.

A review of the relevant literature was conducted to further attempt to properly define the relevant forms and separate them from one another, as well as to confirm that the only three available synonym names for specimens in the complex as of the time this paper was prepared were, 1/ *Bungarus fasciatus* (Schneider, 1801), type locality Bengal, India 2/ *Bungarus annularis* Daudin, 1803, (same type details as for *B. fasciatus*), 3/ *Bungarus fasciatus bifasciatus* Mell, 1929, type locality Yao-shan, Kwangsi Province (Guangxi), China and 4/ *B. fasciatus insularis* Mell, 1930, type locality the Malay Archipelago.

The review also assisted in flagging potential differences between the locally occurring forms throughout the range, as well as sexual dimorphism.

Texts relevant to this review and the taxonomic conclusions within this paper included Ahsan and Rahman (2017), Anwar (2011), Auliya (2006), Bhattarai *et al.* (2017, 2018, 2020), Biakzuala *et al.* (2021, 2023), Boulenger (1896, 1890), Buden and Taboroši (2016), Castoe *et al.* (2007), Chan-ard *et al.* (1999, 2015), Chen *et al.* (2021), Chettri and Chhetry (2013), Cox *et al.* (1998), Das *et al.* (2009), Das (2012), Das and Palden (2000), Daudin (1803), David and Vogel (1996), de Lang (2017), Deshmukh *et al.* (2020), Deuve (1961), Dowling and Jenner (1988), Duméril *et al.* (1854), Dutta *et al.* (2009), Evans (1905), Francis (2021), Fukuyama *et al.* (2021), Gawor *et al.* (2016), Geissler *et al.* (2011), Grismer *et al.* (2008), Hakim *et al.* (2020), Hecht *et al.* (2013), Hofmann *et al.* (2016), Hoser (2018, 2022), Ingle (2020), Janzen (2022), Kastle *et al.* (2013), Khoerunisa *et al.* (2021), Kinnear (1913), Kopstein, (1938), Kuch (1998), Kuch and Schneyer (1993), Kuch *et al.* (2005), Laopichienpong *et al.* (2016), Lenz (2012), Leviton *et al.* (2003), Mahabal and Thakur (2014), Mahony *et al.* (2009), Majumder *et al.* (2012), Majumder (2022), Malkmus *et al.* (2002), Malsawmdawngliana *et al.* (2022), Manthey and Grossmann (1997), Marshall and Strine (2019), Martin (1913), Mell (1929, 1930), Murthy (2010), Murthy *et al.* (2011), Nguyen *et al.* (2009), Nguyen *et al.* (2018), Pandey (2018), Pauwels *et al.* (2003), Prill and Dehling (2021), Purkayastha (2013, 2018), Purkayastha *et al.* (2011), Rabbe *et al.* (2022), Ratnarathorn *et al.* (2019), Rawat *et al.* (2020), Ride *et al.* (1999), Russell (1796), Saint Girons (1972), Schneider (1801), Schulz and Slegers (1985), Shah (1998), Sharma (2004), Sharma *et al.* (2013), Smith (1914, 1943), Stuebing and Inger (1999), Stuebing *et al.* (2014), Supikamolseni *et al.* (2015), Taylor (1965), Tenzin *et al.* (2022), Teynie *et al.* (2010), Thakur (2011), Visvanathan *et al.* (2022), Voris (2000), Wall (1905, 1906, 1908), Wallach *et al.* (2014), Wang *et al.* (2022), Wang *et al.* (2020, 2022), Wangyal (2019), Whitaker and Captain (2004), Zeeb (2012), Zhao (2006), Zhao and Adler (1993), Ziegler (2002), Zug and Mitchell (1995), Zug and Mulcahy (2019) and sources cited therein.

RESULTS

As noted in the abstract and introduction, it was almost immediately self-evident that the population of putative *B. fasciatus* or *B. bifasciatus* from the central Thailand basin and the areas south that border the Gulf of Thailand were sufficiently divergent from all others in the complex to warrant being identified as a separate species, as were those from the Mekong basin, separated from one another by a series of north-south running ranges.

These snakes that are distributionally disjunct by way of major drainage basins (see Voris, 2000), separated by ranges not inhabited by these snakes, were shown by Biakzuala *et al.* (2023) to have species-level molecular divergence from their nearest congener/s and furthermore are consistently divergent in

morphology to enable a formal diagnosis.

On the basis of the preceding, I have no hesitation in formally naming these relevant populations as *Bungarus crotalusei* sp. nov. for the Chao Phraya basin population and *B. daranini* sp. nov. for the Mekong basin population in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride et al. 1999).

The population in Thailand south of the Isthmus of Kra appear to be morphologically divergent from those to the north in Thailand.

However they are apparently associated with the same main drainage system as inferred by the 120 metre sea depth reduction map shown in Voris (2000), meaning that isolation of the populations was recent.

Hence this population, extending south to Singapore, is formally named herein as the subspecies *Bungarus crotalusei peninsularenis* subsp. nov. rather than as a separate full species.

Based on "Map A" in Voris (2000), the drainage basin including Singapore and the lower Malay Peninsula (The so-called "Siam River system"), is not connected to that linking east Sumatra, Java, Bali and southern Borneo, indicating long term separation from that population (that being drained by the "East Sunda River"). Voris (2000) at "Map A" even shows a major drainage system between the other two (the "North Sunda River"), further separating the relevant populations.

As previously noted in the introduction, inspection of specimens from north Borneo, mainly in the Limbang and Baram River drainages of Sarawak, also were clearly divergent from all others.

While morphologically most similar to those of type *B. insularis*, and lower Malay Peninsula *B. crotalusei peninsularenis* subsp. nov. specimens, they have significantly wider yellow bands on the dorsum, relative to the alternating black ones (separating them from *B. crotalusei peninsularenis* subsp. nov.) and dark upper edges of the upper labials, versus white in the Javanese type form of *B. insularis*.

Based on Ice-age drainages as shown by Voris (2000), these snakes are probably biogeographically isolated from all other populations and so are also formally named as a new species, *B. oxyi* sp. nov..

Specimens from south-west Borneo, are morphologically similar to *B. oxyi* sp. nov., but are generally a darker yellow in background colour (and versus cream or whitish-yellow in *B. insularis*) and may in fact represent yet another taxon, as they correspond with the so called "North Sunda River System".

Assigning them to a given taxon has been deferred pending access to more material.

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 a relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spelling 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 14 February 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.

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 (see also Mitchell 1948 and Peters 1863).

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) 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 (Cogger 2014, Dubois et al. 2019).

Claims by the Wüster gang against this paper and the descriptions herein will no doubt be no different to those the gang have made previously, all of which were discredited long ago as outlined by Dubois et al. (2019), Hoser, (2007, 2009a, 2012a, 2012b, 2013, 2015a-f, 2019a, 2019b), ICZN (1991, 2001, 2012, 2021) 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).

BUNGARUS CROTALUSEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:826822C5-8AB1-48CC-8D51-8C81E15A2339

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp R-20340 collected from near Bangkok, Thailand.

This facility allows access to its holdings.

Paratypes: 1/ A preserved juvenile male specimen at the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA, specimen number USNM Amphibians and Reptiles 72061 collected from Bangkok, Thailand.

2/ A preserved male specimen at the Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA, specimen number CM Herps 145381 collected from Bangkok, Thailand.

Diagnosis: The genus *Bungarus* Daudin, 1803, herein including the six species, *B. fasciatus* (Schneider, 1801), from east India, Bangladesh, Myanmar (Burma), Bhutan and Nepal, *B. bifasciatus* (Mell, 1929) from south China and nearby parts of north Vietnam and Laos, *B. insularis* (Mell, 1930) from Java, Bali, east Sumatra and southern Borneo, *B. crotalusei* sp. nov. from central and southern Thailand (and presumably also the lower Malay Peninsula, viz, Malaysia and Singapore), *B. daranini* sp. nov. from the Mekong River drainage basin, including relevant parts of Yunnan, China, Myanmar (Burma), Laos, Cambodia and southern Vietnam and *B. oxyi* sp. nov. from north-west Borneo (North Sarawak and Brunei) are separated from all other species in the tribe Bungarini Eichwald, 1831 by the following unique character suite: Subcaudals single; 15 or rarely 17 dorsal mid-body rows; a dorsal ridge formed by underlying spinous processes of the vertebrae manifesting as a row of enlarged scales along the mid-vertebral line; tail ends very obtusely, sometimes with a swollen tip; a large black mark on nape reaches to between the eyes and the anterior temporal shield is scarcely longer than deep (modified from Hoser, 2018).

These snakes are further characterised by having 199-237 ventrals, 23-41 subcaudals, nuchal band covered by 14-20 vertebral scales; 19-31 black dorsal bands on the body, 2-7 dorsal bands on the tail and a yellow or whitish-cream background colour on the dorsum.

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

B. fasciatus has a yellow background colour, 22-31 dorsal bands on the body, 4-7 dorsal bands on the tail, dark yellow upper labials, boldly etched with black and a temporal formula of 1+2+3.

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. all have 19-21 dorsal bands on the body, (which alone separates them from *B. fasciatus*), a deep yellow background colour, 4-6 dorsal bands on the tail and a temporal formula of 1+2+3, 1+2+2, 2+2+3 or 2+2+2.

B. crotalusei sp. nov. is in turn separated from *B. bifasciatus* by having upper labials that are yellow in colour, but consistently dark edged at the anterior margins, versus the yellow of the upper

labials being heavily peppered (rather than immaculate) in *B. bifasciatus* with the dark markings over the upper labials being in the form of distinctive dark patches in the form of rectangles or similar, rather than uniform etchings of the anterior of each scale.

The subspecies *B. crotalusei peninsularenensis subsp. nov.* is similar in most respects to *B. crotalusei sp. nov.* but instead of a deep yellow colour between the black bands on the dorsum, it has light yellow or cream interspaces on the dorsum, similar to that seen in *B. insularis* and *B. oxyi sp. nov.*

B. crotalusei peninsularenensis subsp. nov. is further separated from *B. crotalusei sp. nov.* by having mainly black on the upper labials, including the inner parts of each and the lower parts, versus yellow and etched dark in *B. crotalusei sp. nov.*, or with dark patches between yellow sections as seen in *B. bifasciatus*.

B. bifasciatus and *B. daranini sp. nov.* have a temporal formula of 1+2+2 or 2+2+2, versus 1+2+3 or 2+2+3 in *B. crotalusei sp. nov.* (and *B. crotalusei peninsularenensis subsp. nov.*).

B. bifasciatus, *B. crotalusei sp. nov.* and *B. daranini sp. nov.* have 217-237 ventrals, that separates them from *B. insularis* which in turn has 199-210. *B. fasciatus* and *B. oxyi sp. nov.* are intermediate with 200-234 ventrals.

B. daranini sp. nov. is separated from both *B. bifasciatus* and *B. crotalusei sp. nov.* by having upper labials that are mainly yellow, with limited peppering on the surfaces and the dark etching forming downward pointing triangles running from the upper edge of the upper labials.

Both *B. daranini sp. nov.* and *B. bifasciatus* are separated from *B. crotalusei sp. nov.* by having dark cross bands on the dorsum being much wider than the intervening yellow, versus not so in *B. crotalusei sp. nov.*

B. daranini sp. nov. is also readily separated from both *B. bifasciatus* and *B. crotalusei sp. nov.* by having the dark cross-bands significantly curl in on the lower flanks, versus not so in the other two species.

B. insularis and *B. oxyi sp. nov.* are separated from the other four species in the genus (the genus as defined by Hoser 2018 and above), by having a washed out yellow or cream/yellow to whitish background colour, versus rich or dark yellow in the four mainland Asian species detailed above (except for the similarly light subspecies *B. crotalusei peninsularenensis subsp. nov.*).

B. oxyi sp. nov. is in turn separated from *B. insularis* by having black bands on the dorsum of significantly narrower in width than the yellow background bands, versus the reverse situation in *B. insularis*, or bands of similar width in all other species in subspecies, except for *B. crotalusei peninsularenensis subsp. nov.*, which also has black bands wider than the lighter intervening areas (versus reverse in the otherwise morphologically similar *B. oxyi sp. nov.*).

In *B. oxyi sp. nov.* (and *B. crotalusei peninsularenensis subsp. nov.*), the lower parts of the upper labials are generally dark in colour, versus generally light (cream) in *B. insularis*.

B. oxyi sp. nov. has a temporal formula of 1+2+2, versus 1+2+3 in *B. insularis*.

The detailed description of Taylor (1965) for Thai "*B. fasciatus*" from Chiang Mai, Chiang Mai Province, northern Thailand, on pages 944 and 945 is in fact of the species *B. crotalusei sp. nov.* *B. fasciatus* is depicted online at:

<https://www.inaturalist.org/observations/69550594>

and

<https://www.inaturalist.org/observations/136658715>

and

<https://www.inaturalist.org/observations/59563338>

B. bifasciatus is depicted online at:

<https://www.flickr.com/photos/189071256@N05/50396259431/>

and

<https://www.inaturalist.org/observations/128112623>

and

<https://www.inaturalist.org/observations/155757022>

and

<https://www.inaturalist.org/observations/49354797>

B. crotalusei sp. nov. is depicted on page 944 of Taylor (1965) and online at:

<https://www.flickr.com/photos/98482848@N00/2247764883/>

and

<https://www.inaturalist.org/observations/142717704>

and

<https://www.inaturalist.org/observations/109511692>

and

<https://www.inaturalist.org/observations/64802846>

B. crotalusei peninsularenensis subsp. nov. is depicted online at:

<https://www.inaturalist.org/observations/106616831>

and

<https://www.inaturalist.org/observations/96553489>

and

<https://www.inaturalist.org/observations/7655880>

B. daranini sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/56005784>

and

<https://www.inaturalist.org/observations/127111416>

and

<https://www.inaturalist.org/observations/74749317>

and

<https://www.inaturalist.org/observations/101870376>

B. insularis is depicted online at:

<https://www.inaturalist.org/observations/101457607>

and

<https://www.inaturalist.org/observations/37187167>

and

<https://www.inaturalist.org/observations/67850292>

B. oxyi sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/147167858>

and

<https://www.inaturalist.org/observations/42482785>

Distribution: *Bungarus crotalusei sp. nov.* appears to be confined to the central parts of Thailand and the northern Malay Peninsula in southern Thailand and nearby northern Peninsula Malaysia. Specimens from the lower Malay Peninsula are also tentatively referred to this species (see the description of *B. crotalusei peninsularenensis subsp. nov.* below).

The Himalayan-Tanasori Mountains form a barrier to the west, separating this taxon from *B. fasciatus*, while the Don Phaya Yen and Sankamphaeng Mountains in the east of Thailand form a separate barrier, partitioning this taxon from *B. daranini sp. nov.* which occupies the Mekong River basin to the east.

Etymology: The species *Bungarus crotalusei sp. nov.* is named in honour of a Great Dane cross Rottweiler dog, named "Crotalus", AKA Crotty, owned by myself in the period 1989 to 2002, in recognition of his role in guarding our research facility in Melbourne, Victoria, Australia from thieves. The spelling of the name "crotalusei" is intentional and should not be altered unless mandated by governing rules.

BUNGARUS DARANINI SP. NOV.

LSIDurn:lsid:zoobank.org:act:2D7E1D41-0923-4940-A0CF-FD1483BEB062

Holotype: A preserved specimen in the North Carolina Museum of Natural Sciences, Raleigh, North Carolina, USA, specimen number NCSM-Herp 80736 collected alive on a dirt road through scrub and semi-evergreen forest along the Nam Lan River (part of the Mekong River drainage basin), from the Nam Lan Conservation Area, Ban Na Ten Village, at 683 m elevation, Boun Tai, Phongsaly, Laos, Latitude 21.3324 N., Longitude 101.8826 E. This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen in the North Carolina Museum of Natural Sciences, Raleigh, North Carolina, USA, specimen number NCSM-Herp 86467 collected on the ground, 2 metres from a swift rocky stream in a semi-evergreen forest at 609 metres elevation, at Houay Lick, in the Phou Dendin National Protected Area, Phongsaly, Laos, Latitude 22.0676 N., Longitude

102.243 E.

2/ A preserved specimen in the Herpetology Collection of the Royal Ontario Museum, Toronto, Canada, specimen number ROM 41546, collected from 8.8 km west of Simao, Yunnan, China, Latitude 22.77998 N., Longitude 100.906677 E.

3/ A preserved adult specimen in the North Carolina Museum of Natural Sciences, Raleigh, North Carolina, USA, specimen number NCSM-Herp 84993 collected from leaf litter in semi-evergreen forest with limestone karst at MMG Sepon Mine, Tham Bing, Vilabouli, Savannakhet, Laos at 262 metres elevation, Latitude 16.9503 N., Longitude 105.8959 E.

4/ A preserved male specimen at the National Museum of Natural History, Smithsonian Institution, Washington DC, USA, specimen number USNM Amphibians and Reptiles 68141, collected from 90 km up the Mekong River from Vientiane, in Laos.

5/ A preserved male specimen at the National Museum of Natural History, Smithsonian Institution, Washington DC, USA, specimen number USNM Amphibians and Reptiles 279012, collected from Nakhon Phanom Royal Thai Air Force Base, Thailand.

Diagnosis: The genus *Bungarus* Daudin, 1803, herein including the six species, *B. fasciatus* (Schneider, 1801), from east India, Bangladesh, Myanmar (Burma), Bhutan and Nepal, *B. bifasciatus* (Mell, 1929) from south China and nearby parts of north Vietnam and Laos, *B. insularis* (Mell, 1930) from Java, Bali, east Sumatra and southern Borneo, *B. crotalusei* sp. nov. from central and southern Thailand (and presumably also the lower Malay Peninsula, viz, Malaysia and Singapore), *B. daranini* sp. nov. from the Mekong River drainage basin, including relevant parts of Yunnan, China, Myanmar (Burma), Laos, Cambodia and southern Vietnam and *B. oxyi* sp. nov. from north-west Borneo (North Sarawak and Brunei) are separated from all other species in the tribe Bungarini Eichwald, 1831 by the following unique character suite: Subcaudals single; 15 or rarely 17 dorsal mid-body rows; a dorsal ridge formed by underlying spinous processes of the vertebrae manifesting as a row of enlarged scales along the mid-vertebral line; tail ends very obtusely, sometimes with a swollen tip; a large black mark on nape reaches to between the eyes and the anterior temporal shield is scarcely longer than deep (modified from Hoser, 2018).

These snakes are further characterised by having 199-237 ventrals, 23-41 subcaudals, nuchal band covered by 14-20 vertebral scales; 19-31 black dorsal bands on the body, 2-7 dorsal bands on the tail and a yellow or whitish-cream background colour on the dorsum.

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

B. fasciatus has a yellow background colour, 22-31 dorsal bands on the body, 4-7 dorsal bands on the tail, dark yellow upper labials, boldly etched with black and a temporal formula of 1+2+3.

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. all have 19-21 dorsal bands on the body, (which alone separates them from *B. fasciatus*), a deep yellow background colour, 4-6 dorsal bands on the tail and a temporal formula of 1+2+3, 1+2+2, 2+2+3 or 2+2+2.

B. crotalusei sp. nov. is in turn separated from *B. bifasciatus* by having upper labials that are yellow in colour, but consistently dark edged at the anterior margins, versus the yellow of the upper labials being heavily peppered (rather than immaculate) in *B. bifasciatus* with the dark markings over the upper labials being in the form of distinctive dark patches in the form of rectangles or similar, rather than uniform etchings of the anterior of each scale. The subspecies *B. crotalusei peninsularenis* subsp. nov. is similar in most respects to *B. crotalusei* sp. nov. but instead of a deep yellow colour between the black bands on the dorsum, it has light yellow or cream interspaces on the dorsum, similar to that seen in *B. insularis* and *B. oxyi* sp. nov..

B. crotalusei peninsularenis subsp. nov. is further separated from *B. crotalusei* sp. nov. by having mainly black on the upper labials, including the inner parts of each and the lower parts, versus yellow and etched dark in *B. crotalusei* sp. nov., or with dark patches between yellow sections as seen in *B. bifasciatus*.

B. bifasciatus and *B. daranini* sp. nov. have a temporal formula of 1+2+2 or 2+2+2, versus 1+2+3 or 2+2+3 in *B. crotalusei* sp. nov. (and *B. crotalusei peninsularenis* subsp. nov.).

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. have 217-237 ventrals, that separates them from *B. insularis* which in turn has 199-210. *B. fasciatus* and *B. oxyi* sp. nov. are intermediate with 200-234 ventrals.

B. daranini sp. nov. is separated from both *B. bifasciatus* and *B. crotalusei* sp. nov. by having upper labials that are mainly yellow, with limited peppering on the surfaces and the dark etching forming downward pointing triangles running from the upper edge of the upper labials.

Both *B. daranini* sp. nov. and *B. bifasciatus* are separated from *B. crotalusei* sp. nov. by having dark cross bands on the dorsum being much wider than the intervening yellow, versus not so in *B. crotalusei* sp. nov..

B. daranini sp. nov. is also readily separated from both *B. bifasciatus* and *B. crotalusei* sp. nov. by having the dark cross-bands significantly curl in on the lower flanks, versus not so in the other two species.

B. insularis and *B. oxyi* sp. nov. are separated from the other four species in the genus (the genus as defined by Hoser 2018 and above), by having a washed out yellow or cream/yellow to whitish background colour, versus rich or dark yellow in the four mainland Asian species detailed above (except for the similarly light subspecies *B. crotalusei peninsularenis* subsp. nov.).

B. oxyi sp. nov. is in turn separated from *B. insularis* by having black bands on the dorsum of significantly narrower in width than the yellow background bands, versus the reverse situation in *B. insularis*, or bands of similar width in all other species in subspecies, except for *B. crotalusei peninsularenis* subsp. nov., which also has black bands wider than the lighter intervening areas (versus reverse in the otherwise morphologically similar *B. oxyi* sp. nov.).

In *B. oxyi* sp. nov. (and *B. crotalusei peninsularenis* subsp. nov.), the lower parts of the upper labials are generally dark in colour, versus generally light (cream) in *B. insularis*.

B. oxyi sp. nov. has a temporal formula of 1+2+2, versus 1+2+3 in *B. insularis*.

The detailed description of Taylor (1965) for Thai "*B. fasciatus*" from Chiang Mai, Chiang Mai Province, northern Thailand, on pages 944 and 945 is in fact of the species *B. crotalusei* sp. nov.. *B. fasciatus* is depicted online at:

<https://www.inaturalist.org/observations/69550594>

and

<https://www.inaturalist.org/observations/136658715>

and

<https://www.inaturalist.org/observations/59563338>

B. bifasciatus is depicted online at:

<https://www.flickr.com/photos/189071256@N05/50396259431/>

and

<https://www.inaturalist.org/observations/128112623>

and

<https://www.inaturalist.org/observations/155757022>

and

<https://www.inaturalist.org/observations/49354797>

B. crotalusei sp. nov. is depicted on page 944 of Taylor (1965) and online at:

<https://www.flickr.com/photos/98482848@N00/2247764883/>

and

<https://www.inaturalist.org/observations/142717704>

and

<https://www.inaturalist.org/observations/109511692>

and

<https://www.inaturalist.org/observations/64802846>

B. crotalusei peninsularenis subsp. nov. is depicted online at:

<https://www.inaturalist.org/observations/106616831>

and

<https://www.inaturalist.org/observations/96553489>

and

<https://www.inaturalist.org/observations/7655880>

B. daranini sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/56005784>

and

<https://www.inaturalist.org/observations/127111416>

and

<https://www.inaturalist.org/observations/74749317>

and

<https://www.inaturalist.org/observations/101870376>

B. insularis is depicted online at:

<https://www.inaturalist.org/observations/101457607>

and

<https://www.inaturalist.org/observations/37187167>

and

<https://www.inaturalist.org/observations/67850292>

B. oxyi sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/147167858>

and

<https://www.inaturalist.org/observations/42482785>

Distribution: *Bungarus daranini* sp. nov. appears to be confined to Mekong River drainage system, in the region from Yunnan, south-west China, in the north, through relevant parts of Myanmar (Burma), Laos, Thailand, Cambodia and Vietnam in the south.

Etymology: The species *Bungarus daranini* sp. nov. with a centre of distribution including most of Cambodia, is named in honour of Dara Nin of Ringwood, Victoria, Australia formerly working with Snakebusters, Australia's best reptiles, and more recently employed by the Victoria Police Force, in Melbourne, Victoria, Australia, in recognition for his services to herpetology over about a decade.

Dara Nin is of Cambodian background, although born in New Zealand and raised in Australia.

BUNGARUS OXYI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:81FF0C54-E986-4428-8FC0-8D2D32191CE9

Holotype: A preserved specimen in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp R-11264 collected from the Limbang River District, North Sarawak, Borneo, Malaysia.

This facility allows access to its holdings.

Paratypes: Two preserved specimens in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ Herp R-15248-15249, both collected from Baram, Sarawak, Borneo, Malaysia, and two more preserved specimens at the University Museum of Zoology Cambridge (Zoology), Cambridge, UK, specimen numbers: UMZC Vertebrates R9. 168/3 -168/4 both also collected from the Baram District, Sarawak, Borneo, Malaysia.

Diagnosis: The genus *Bungarus* Daudin, 1803, herein including the six species, *B. fasciatus* (Schneider, 1801), from east India, Bangladesh, Myanmar (Burma), Bhutan and Nepal, *B. bifasciatus* (Mell, 1929) from south China and nearby parts of north Vietnam and Laos, *B. insularis* (Mell, 1930) from Java, Bali, east Sumatra and southern Borneo, *B. crotalusei* sp. nov. from central and southern Thailand (and presumably also the lower Malay Peninsula, viz, Malaysia and Singapore), *B. daranini* sp. nov. from the Mekong River drainage basin, including relevant parts of Yunnan, China, Myanmar (Burma), Laos, Cambodia and southern Vietnam and *B. oxyi* sp. nov. from north-west Borneo (North Sarawak and Brunei) are separated from all other species in the tribe Bungarini Eichwald, 1831 by the following unique character suite: Subcaudals single; 15 or rarely 17 dorsal mid-body rows; a dorsal ridge formed by underlying spinous processes of the vertebrae manifesting as a row of enlarged scales along the mid-vertebral line; tail ends very obtusely, sometimes with a swollen tip; a large black mark on nape reaches to between the eyes and the anterior temporal shield is scarcely longer than deep (modified from Hoser, 2018).

These snakes are further characterised by having 199-237 ventrals, 23-41 subcaudals, nuchal band covered by 14-20 vertebral scales; 19-31 black dorsal bands on the body, 2-7 dorsal bands on the tail and a yellow or whitish-cream background colour on the dorsum.

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

B. fasciatus has a yellow background colour, 22-31 dorsal bands on the body, 4-7 dorsal bands on the tail, dark yellow upper labials, boldly etched with black and a temporal formula of 1+2+3.

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. all have 19-21 dorsal bands on the body, (which alone separates them from *B. fasciatus*), a deep yellow background colour, 4-6 dorsal bands on the tail and a temporal formula of 1+2+3, 1+2+2, 2+2+3 or 2+2+2.

B. crotalusei sp. nov. is in turn separated from *B. bifasciatus* by having upper labials that are yellow in colour, but consistently dark edged at the anterior margins, versus the yellow of the upper labials being heavily peppered (rather than immaculate) in *B. bifasciatus* with the dark markings over the upper labials being in the form of distinctive dark patches in the form of rectangles or similar, rather than uniform etchings of the anterior of each scale.

The subspecies *B. crotalusei peninsularenis* subsp. nov. is similar in most respects to *B. crotalusei* sp. nov. but instead of a deep yellow colour between the black bands on the dorsum, it has light yellow or cream interspaces on the dorsum, similar to that seen in *B. insularis* and *B. oxyi* sp. nov.

B. crotalusei peninsularenis subsp. nov. is further separated from *B. crotalusei* sp. nov. by having mainly black on the upper labials, including the inner parts of each and the lower parts, versus yellow and etched dark in *B. crotalusei* sp. nov., or with dark patches between yellow sections as seen in *B. bifasciatus*.

B. bifasciatus and *B. daranini* sp. nov. have a temporal formula of 1+2+2 or 2+2+2, versus 1+2+3 or 2+2+3 in *B. crotalusei* sp. nov. (and *B. crotalusei peninsularenis* subsp. nov.).

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. have 217-237 ventrals, that separates them from *B. insularis* which in turn has 199-210. *B. fasciatus* and *B. oxyi* sp. nov. are intermediate with 200-234 ventrals.

B. daranini sp. nov. is separated from both *B. bifasciatus* and *B. crotalusei* sp. nov. by having upper labials that are mainly yellow, with limited peppering on the surfaces and the dark etching forming downward pointing triangles running from the upper edge of the upper labials.

Both *B. daranini* sp. nov. and *B. bifasciatus* are separated from *B. crotalusei* sp. nov. by having dark cross bands on the dorsum being much wider than the intervening yellow, versus not so in *B. crotalusei* sp. nov..

B. daranini sp. nov. is also readily separated from both *B. bifasciatus* and *B. crotalusei* sp. nov. by having the dark cross-bands significantly curl in on the lower flanks, versus not so in the other two species.

B. insularis and *B. oxyi* sp. nov. are separated from the other four species in the genus (the genus as defined by Hoser 2018 and above), by having a washed out yellow or cream/yellow to whitish background colour, versus rich or dark yellow in the four mainland Asian species detailed above (except for the similarly light subspecies *B. crotalusei peninsularenis* subsp. nov.).

B. oxyi sp. nov. is in turn separated from *B. insularis* by having black bands on the dorsum of significantly narrower in width than the yellow background bands, versus the reverse situation in *B. insularis*, or bands of similar width in all other species in subspecies, except for *B. crotalusei peninsularenis* subsp. nov., which also has black bands wider than the lighter intervening areas (versus reverse in the otherwise morphologically similar *B. oxyi* sp. nov.).

In *B. oxyi* sp. nov. (and *B. crotalusei peninsularenis* subsp. nov.), the lower parts of the upper labials are generally dark in colour, versus generally light (cream) in *B. insularis*.

B. oxyi sp. nov. has a temporal formula of 1+2+2, versus 1+2+3 in *B. insularis*.

The detailed description of Taylor (1965) for Thai "*B. fasciatus*" from Chiang Mai, Chiang Mai Province, northern Thailand, on pages 944 and 945 is in fact of the species *B. crotalusei* sp. nov.. *B. fasciatus* is depicted online at:

<https://www.inaturalist.org/observations/69550594>
and

<https://www.inaturalist.org/observations/136658715>
and

<https://www.inaturalist.org/observations/59563338>

B. bifasciatus is depicted online at:

<https://www.flickr.com/photos/189071256@N05/50396259431/>
and

<https://www.inaturalist.org/observations/128112623>
and

<https://www.inaturalist.org/observations/155757022>
and

<https://www.inaturalist.org/observations/49354797>

B. crotalusei sp. nov. is depicted on page 944 of Taylor (1965) and online at:

<https://www.flickr.com/photos/98482848@N00/2247764883/>
and

<https://www.inaturalist.org/observations/142717704>
and

<https://www.inaturalist.org/observations/109511692>
and

<https://www.inaturalist.org/observations/64802846>

B. crotalusei peninsularenensis subsp. nov. is depicted online at:

<https://www.inaturalist.org/observations/106616831>
and

<https://www.inaturalist.org/observations/96553489>
and

<https://www.inaturalist.org/observations/7655880>

B. daranini sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/56005784>
and

<https://www.inaturalist.org/observations/127111416>
and

<https://www.inaturalist.org/observations/74749317>
and

<https://www.inaturalist.org/observations/101870376>

B. insularis is depicted online at:

<https://www.inaturalist.org/observations/101457607>
and

<https://www.inaturalist.org/observations/37187167>
and

<https://www.inaturalist.org/observations/67850292>

B. oxyi sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/147167858>
and

<https://www.inaturalist.org/observations/42482785>

Distribution: *Bungarus oxyi* sp. nov. appears to be confined to the north-western parts of Borneo, generally in the vicinity of the Limbang and Baram River drainage systems.

Etymology: The species *Bungarus oxyi* sp. nov. is named in honour of a Great Dane dog, named "Oxyuranus", AKA Oxy, owned by myself in the period 2004 to 2012, in recognition of his role in guarding our research facility in Melbourne, Victoria, Australia from thieves. The spelling of the name "oxyi" is intentional and should not be altered unless mandated by governing rules.

BUNGARUS CROTALUSEI PENINSULARENENSIS SUBSP. NOV.
LSIDurn:lsid:zoobank.org:act:D1D20DB7-47CF-4AEA-A273-9DCF5D221D51

Holotype: A preserved specimen at the Amphibians and Reptiles collection of the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH 229812 collected from Johore, Malaysia.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen number ZMUC-R65298, collected from Malakka, Malaysia.

2/ A preserved specimen at the Amphibians and Reptiles collection at the Natural History Museum of Denmark (SNM), Copenhagen, Denmark, specimen number ZMUC-R65282 collected from Pulo Penang, Malaysia.

3/ A preserved specimen at the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA, specimen number USNM Amphibians and Reptiles 142421 collected from Kuala Lumpur, Airport, Malaysia.

Diagnosis: The genus *Bungarus* Daudin, 1803, herein including the six species, *B. fasciatus* (Schneider, 1801), from east India, Bangladesh, Myanmar (Burma), Bhutan and Nepal, *B. bifasciatus* (Mell, 1929) from south China and nearby parts of north Vietnam and Laos, *B. insularis* (Mell, 1930) from Java, Bali, east Sumatra and southern Borneo, *B. crotalusei* sp. nov. from central and southern Thailand (and presumably also the lower Malay Peninsula, viz, Malaysia and Singapore), *B. daranini* sp. nov. from the Mekong River drainage basin, including relevant parts of Yunnan, China, Myanmar (Burma), Laos, Cambodia and southern Vietnam and *B. oxyi* sp. nov. from north-west Borneo (North Sarawak and Brunei) are separated from all other species in the tribe Bungarini Eichwald, 1831 by the following unique character suite: Subcaudals single; 15 or rarely 17 dorsal mid-body rows; a dorsal ridge formed by underlying spinous processes of the vertebrae manifesting as a row of enlarged scales along the mid-vertebral line; tail ends very obtusely, sometimes with a swollen tip; a large black mark on nape reaches to between the eyes and the anterior temporal shield is scarcely longer than deep (modified from Hoser, 2018).

These snakes are further characterised by having 199-237 ventrals, 23-41 subcaudals, nuchal band covered by 14-20 vertebral scales; 19-31 black dorsal bands on the body, 2-7 dorsal bands on the tail and a yellow or whitish-cream background colour on the dorsum.

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

B. fasciatus has a yellow background colour, 22-31 dorsal bands on the body, 4-7 dorsal bands on the tail, dark yellow upper labials, boldly etched with black and a temporal formula of 1+2+3.

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. all have 19-21 dorsal bands on the body, (which alone separates them from *B. fasciatus*), a deep yellow background colour, 4-6 dorsal bands on the tail and a temporal formula of 1+2+3, 1+2+2, 2+2+3 or 2+2+2.

B. crotalusei sp. nov. is in turn separated from *B. bifasciatus* by having upper labials that are yellow in colour, but consistently dark edged at the anterior margins, versus the yellow of the upper labials being heavily peppered (rather than immaculate) in *B. bifasciatus* with the dark markings over the upper labials being in the form of distinctive dark patches in the form of rectangles or similar, rather than uniform etchings of the anterior of each scale.

The subspecies *B. crotalusei peninsularenensis* subsp. nov. is similar in most respects to *B. crotalusei* sp. nov. but instead of a deep yellow colour between the black bands on the dorsum, it has light yellow or cream interspaces on the dorsum, similar to that seen in *B. insularis* and *B. oxyi* sp. nov..

B. crotalusei peninsularenensis subsp. nov. is further separated from *B. crotalusei* sp. nov. by having mainly black on the upper labials, including the inner parts of each and the lower parts, versus yellow and etched dark in *B. crotalusei* sp. nov., or with dark patches between yellow sections as seen in *B. bifasciatus*.

B. bifasciatus and *B. daranini* sp. nov. have a temporal formula of 1+2+2 or 2+2+2, versus 1+2+3 or 2+2+3 in *B. crotalusei* sp. nov. (and *B. crotalusei peninsularenensis* subsp. nov.).

B. bifasciatus, *B. crotalusei* sp. nov. and *B. daranini* sp. nov. have 217-237 ventrals, that separates them from *B. insularis* which in turn has 199-210. *B. fasciatus* and *B. oxyi* sp. nov. are intermediate with 200-234 ventrals.

B. daranini sp. nov. is separated from both *B. bifasciatus* and *B. crotalusei* sp. nov. by having upper labials that are mainly yellow, with limited peppering on the surfaces and the dark etching forming downward pointing triangles running from the upper edge of the upper labials.

Both *B. daranini* sp. nov. and *B. bifasciatus* are separated from *B. crotalusei* sp. nov. by having dark cross bands on the dorsum being much wider than the intervening yellow, versus not so in *B. crotalusei* sp. nov..

B. daranini sp. nov. is also readily separated from both *B. bifasciatus* and *B. crotalusei* sp. nov. by having the dark cross-bands significantly curl in on the lower flanks, versus not so in the other two species.

B. insularis and *B. oxyi* sp. nov. are separated from the other four species in the genus (the genus as defined by Hoser 2018 and above), by having a washed out yellow or cream/yellow to whitish background colour, versus rich or dark yellow in the four mainland Asian species detailed above (except for the similarly light subspecies *B. crotalusei peninsularenensis* subsp. nov.).

B. oxyi sp. nov. is in turn separated from *B. insularis* by having black bands on the dorsum of significantly narrower in width than the yellow background bands, versus the reverse situation in *B. insularis*, or bands of similar width in all other species in subspecies, except for *B. crotalusei peninsularenensis* subsp. nov., which also has black bands wider than the lighter intervening areas (versus reverse in the otherwise morphologically similar *B. oxyi* sp. nov.).

In *B. oxyi* sp. nov. (and *B. crotalusei peninsularenensis* subsp. nov.), the lower parts of the upper labials are generally dark in colour, versus generally light (cream) in *B. insularis*.

B. oxyi sp. nov. has a temporal formula of 1+2+2, versus 1+2+3 in *B. insularis*.

The detailed description of Taylor (1965) for Thai "*B. fasciatus*" from Chiang Mai, Chiang Mai Province, northern Thailand, on pages 944 and 945 is in fact of the species *B. crotalusei* sp. nov..

B. fasciatus is depicted online at:

<https://www.inaturalist.org/observations/69550594>

and

<https://www.inaturalist.org/observations/136658715>

and

<https://www.inaturalist.org/observations/59563338>

B. bifasciatus is depicted online at:

<https://www.flickr.com/photos/189071256@N05/50396259431/>

and

<https://www.inaturalist.org/observations/128112623>

and

<https://www.inaturalist.org/observations/155757022>

and

<https://www.inaturalist.org/observations/49354797>

B. crotalusei sp. nov. is depicted on page 944 of Taylor (1965) and online at:

<https://www.flickr.com/photos/98482848@N00/2247764883/>

and

<https://www.inaturalist.org/observations/142717704>

and

<https://www.inaturalist.org/observations/109511692>

and

<https://www.inaturalist.org/observations/64802846>

B. crotalusei peninsularenensis subsp. nov. is depicted online at:

<https://www.inaturalist.org/observations/106616831>

and

<https://www.inaturalist.org/observations/96553489>

and

<https://www.inaturalist.org/observations/7655880>

B. daranini sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/56005784>

and

<https://www.inaturalist.org/observations/127111416>

and

<https://www.inaturalist.org/observations/74749317>

and

<https://www.inaturalist.org/observations/101870376>

B. insularis is depicted online at:

<https://www.inaturalist.org/observations/101457607>

and

<https://www.inaturalist.org/observations/37187167>

and

<https://www.inaturalist.org/observations/67850292>

B. oxyi sp. nov. is depicted online at:

<https://www.inaturalist.org/observations/147167858>

and

<https://www.inaturalist.org/observations/42482785>

Distribution: *Bungarus crotalusei peninsularenensis suboxyi* sp. nov. appears to be confined to the Malay Peninsular, south of the Isthmus of Kra, all the way to Singapore in the far south.

Etymology: The subspecies *Bungarus crotalusei peninsularenensis subsp. nov.* is named in reflection of where it occurs, being the lower Malay Peninsular.

CONSERVATION THREATS TO *BUNGARUS CROTALUSEI* SP. NOV., *B. DARANINI* SP. NOV. AND *B. OXYI* SP. NOV.

There are no known significant immediate conservation threats to the newly named species, although the best part of the habitat for these taxa have been effectively erased by the creation of endless expanses rice paddies, palm oil plantations or other forms of intensive human farming, with riverine habitats generally degraded by intense human settlement and activities.

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 regimes, introduced 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.

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), (see also Mitchell (1948) and Peters (1863)).

REFERENCES CITED

- Ahsan, M. F. and Rahman, M. M. 2017. Status, distribution and threats of kraits (Squamata: Elapidae: *Bungarus*) in Bangladesh. *Journal of Threatened Taxa* 9(3):9903-9910.
- Anwar, M. 2011. First record of banded krait (*Bungarus fasciatus*) from Pilibhit District, Uttar Pradesh - India. *Taprobanica* 3(2):102-103.
- Auliya, M. 2006. *Taxonomy, Life History, and conservation of giant reptiles in west Kalimantan*. Natur und Tier Verlag, Münster, Germany:432 pp.
- Bhattarai, S., Chiranjibi, P., Pokheral, B. L. and Subedi, N. 2017. Herpetofauna of a Ramsar Site: Beeshazar and Associated Lakes, Chitwan National Park, Nepal. *IRCF Reptiles and Amphibians* 24 (1):17-29.
- Bhattarai, S., Pokheral, C. P., Lamichhane, B. R., Regmi, U. R., Ram, A. K. and Subedi, N. 2018. Amphibians and reptiles of Parsa National Park, Nepal. *Amphibian and Reptile Conservation* 12(1):35-48.
- Bhattarai, S., Gurung, A., Lamichhane, B. R., Regmi, R., Dhungana, M., Kumpakha, B. and Subedi, N. 2020. Amphibians and Reptiles of Chure Range, Nepal. President Chure Terai-Madhes Conservation Development Board and National Trust for Nature Conservation, Khumaltar, Lalitpur, Nepal.
- Biakzuala, L., Malsawmtluanga, and Lalremsanga, H. T. 2021. Ophiophagy by banded krait (*Bungarus fasciatus*) exposed by a road kill. *Taprobanica* 10(2):127-127.
- Biakzuala, L., Lalremsanga, H. T., Santra, V., Dhara, A., Ahmed, M. T., Mallick, Z. B., Kuttalam, S., Thasun Amarasinghe, A. A. and Malhorta, A. 2022. Black and white: Molecular phylogeny reveals distinct evolutionary lineages of the Banded Krait,

- Bungarus fasciatus* (Squamata: Elapidae) in Asia. *Scientific Reports*:13:2061:15 pp (online).
- Boulenger, G. A. 1896. *Catalogue of the snakes in the British Museum, Vol. 3*. London (Taylor and Francis), London, UK:xiv+727 pp.
- Boulenger, G. A. 1890. *The Fauna of British India, Including Ceylon and Burma. Reptilia and Batrachia*. Taylor and Francis, London, UK:xviii+541 pp.
- Buden, D. W. and Taboroši, D. 2016. *Reptiles of the Federated States of Micronesia*. Island Research and Education Initiative:311 pp.
- Castoe, T. A., Smith, E. N., Brown, R. M. and Parkinson, C. L. 2007. Higher-level phylogeny of Asian and American coralsnakes, their placement within the Elapidae (Squamata), and the systematic affinities of the enigmatic Asian coralsnake *Hemibungarus calligaster* (Wiegmann, 1834). *Zoological Journal of the Linnean Society* 151:809-831.
- Chan-ard, T., Grossmann, W., Gumprecht, A. and Schulz, K. D. 1999. Amphibians and reptiles of peninsular Malaysia and Thailand - an illustrated checklist. Bushmaster Publications, Würselen, Germany:240 pp.
- Chan-ard, T., Parr, J. W. K. and Nabhitabhata, J. 2015. *A field guide to the reptiles of Thailand*. Oxford University Press, NY, USA:352 pp.
- Chen, Z. N., Shi, S. C., Vogel, G., Ding, L. and Shi, J. S. 2021. Multiple lines of evidence reveal a new species of Krait (Squamata, Elapidae, *Bungarus*) from Southwestern China and Northern Myanmar. *ZooKeys* 1025:35.
- Chettri, K. and Chhetry, D. T. 2013. Diversity of Snakes in Sarlahi District, Nepal. *Our Nature* 11(2):201-207.
- Cogger, H. G. 2014. *Reptiles and Amphibians of Australia* (Seventh edition), CSIRO. Sydney, Australia:1064 pp.
- Cox, M. J., Van Dijk, P. P., Nabhitabhata J. and Thirakhuapt, K. 1998. *A Photographic Guide to Snakes and Other Reptiles of Peninsular Malaysia, Singapore and Thailand*. Ralph Curtis Publishing:144 pp.
- Das, A., Saikia, U., Murthy, B. H. C. K., Dey, S. and Dutta, S. K. 2009. A herpetofaunal inventory of Barail Wildlife Sanctuary and adjacent regions, Assam, north-eastern India. *Hamadryad* 34(1):117-134.
- Das, I. 2012. *A Naturalist's Guide to the Snakes of South-East Asia: Malaysia, Singapore, Thailand, Myanmar, Borneo, Sumatra, Java and Bali*. Oxford John Beaufoy Publishing:160 pp.
- Das, I. and Palden, J. 2000. A herpetological collection from Bhutan, with new country records. *Herpetological Review* 31(4):256-258.
- Daudin, F. M. 1803. *Histoire naturelle generale et particuliere des reptiles*, 8 vol. F. Dufart, Paris, France.
- David, P. and Vogel, G. 1996. *The snakes of Sumatra. An annotated checklist and key with natural history notes*. Bücher Kreth, Frankfurt AM, Germany.
- de Lang, R. 2017. *The Snakes of Java, Bali and Surrounding Islands*. Edition Chimaira, Frankfurt am Main, Germany:435 pp.
- Deshmukh, R. V., Deshmukh, S. A., Badhekar, S. A. and Naitame, R. Y. 2020. Snakes of Bhandara District, Maharashtra, Central India with notes on natural history. *IRCF Reptiles and Amphibians* 27(1):10-17.
- Deuve, J. 1961. Liste annotée des Serpents du Laos. *Bull. Soc. Sci. Nat. Laos* 1:5-32.
- Dowling, H. G. and Jenner, J. V. 1988. Snakes of Burma: checklist of reported species and bibliography. *Smithsonian Herp. Inf. Serv.* (76):19 pp.
- Dubois, A., Bauer, A. M., Ceriaco, L. M. P., Dusouler, F., Fretey, T., Lobl, I., Lorvelec, O., Ohler, A., Stopiglia, R. and Aescht, E. 2019. The Linz Zoocode project: a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. First report of activities (2014–2019). *Bionomina*, 17: 1-111
- Duméril, A. M. C., Bibron, G. and Duméril, A. H. A., 1854. *Erpétologie générale ou histoire naturelle complète des reptiles. Tome septième. Deuxième partie, comprenant l'histoire des serpents venimeux*. Paris, Librairie Encyclopédique de Roret: i-xii+781-1536.
- Dutta, S. K., Nair, M. V., Mohapatra, P. P. and Mahapatra, A. K. 2009. *Amphibians and reptiles of Similipal Biosphere Reserve*. Regional Plant Resource Centre, Bhubaneswar, Orissa, India.
- Evans, G. H. 1905. Breeding of the Banded Krait (*Bungarus fasciatus*) in Burma. *J. of the Bombay Nat. His. Soc.* 16: 519-520.
- Francis, A. 2021. *A field guide to the snakes of Hong Kong*. Regal Printing, Hong Kong.
- Fukuyama, R., Fukuyama, I., Kurita, T., Kojima, Y., Hossman, M. Y., Noda, A. and Nishikawa, K. 2021. New herpetofaunal records from Gunung Mulu National Park and its surrounding areas in Borneo. *Herpetozoa* 34:89-96.
- Gawor, A., Pham, C. T., Nguyen, T. Q., Nguyen, T. T., Schmitz, A. and Ziegler, T. 2016. The herpetofauna of the Bai Tu Long National Park, northeastern Vietnam. *Salamandra* 52(1):23-41.
- Geissler, P., Nguyen, T. Q., Poyarkov, N. A. and Böhme, W. 2011. New records of snakes from Cat Tien National Park, Dong Nai and Lam Dong provinces, southern Vietnam. *Bonn Zoological Bulletin* 60(1):9-16.
- Grismer, L. L., Neang, T., Chav, T., Wood, P. L., Oaks, J. R., Holden, J., Grismer, J. L., Szutz, T. R. and Youmans, T. M. 2008. Additional amphibians and reptiles from the Phnom Samkos Wildlife Sanctuary in Northwestern Cardamom Mountains, Cambodia, with comments on their taxonomy and the discovery of three new species. *Raffles Bulletin of Zoology* 56(1):161-175.
- Grismer, L. L., Neang, T., Chav, T. and Grismer, J. L. 2008. Checklist of the amphibians and reptiles of the Cardamom region of Southwestern Cambodia. *Cambodian Journal of Natural History* 2008(1):12-28.
- Hakim, J., Trageser, S. J., Ghose, A., Rashid, S. M. A. and Rahman, S. C. 2020. Amphibians and reptiles from Lawachara National Park in Bangladesh. *Check List* 16:1239.
- Hecht, V. L., Pham, C. L., Nguyen, T. T., Nguyen, T. Q., Bonkowski, M. and Ziegler, T. 2013. First report on the herpetofauna of Tay Yen Tu Nature Reserve, northeastern Vietnam. *Biodiversity Journal* 4(4):507-552.
- Hofmann, S., Fritzsche, P. and Miede, G. 2016. A new record of *Elaphe dione* from high altitude in Western Sichuan reveals high intraspecific differentiation. *Salamandra* 52(3):273-277.
- Hoser, R. T. 2007. Wells and Wellington - It's time to bury the hatchet. *Calodema* Supplementary Paper 1:1-9.
- Hoser, R. T. 2009a. Creationism and contrived science: A review of recent python systematics papers and the resolution of issues of taxonomy and nomenclature. *Australasian Journal of Herpetology* 2:1-34. (3 February).
- Hoser, R. 2009b. Eight new taxa in the genera *Pseudonaja* Gunther 1858, *Oxyuranus* Kinghorn 1923, and *Panacetechis* Wells and Wellington 1985 (Serpentes:Elapidae). *Australasian Journal of Herpetology* 4:1-27.
- Hoser, R. T. 2012a. Exposing a fraud! *Afronaja* Wallach, Wüster and Broadley 2009, is a junior synonym of *Spracklandus* Hoser 2009! *Australasian Journal of Herpetology* 9 (3 April 2012):1-64.
- Hoser, R. T. 2012b. Robust taxonomy and nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.
- Hoser, R. T. 2013. The science of herpetology is built on evidence, ethics, quality publications and strict compliance with the rules of nomenclature. *Australasian Journal of Herpetology* 18:2-79.
- Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian J. of Herpetology* 25:3-13.
- Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.

- Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-64.
- Hoser, R. T. 2015d. PRINO (Peer reviewed in name only) journals: When quality control in scientific publications fails. *Australasian Journal of Herpetology* 26:3-64.
- Hoser, R. T. 2015e. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.
- Hoser, R. T. 2015f. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). *Australasian Journal of Herpetology* 27:37-54.
- Hoser, R. T. 2018. A sensible breakup of the genus *Bungarus* Daudin, 1803 *sensu lato* and the description of a new species. *Australasian Journal of Herpetology* 36:11-20.
- Hoser, R. T. 2019a. 11 new species, 4 new subspecies and a subgenus of Australian Dragon Lizard in the genus *Tympanocryptis* Peters, 1863, with a warning on the conservation status and long-term survival prospects of some newly named taxa. *Australasian Journal of Herpetology* 39:23-52.
- Hoser, R. T. 2019b. Richard Shine *et al.* (1987), Hinrich Kaiser *et al.* (2013), Jane Melville *et al.* (2018 and 2019): Australian Agamids and how rule breakers, liars, thieves, taxonomic vandals and law breaking copyright infringers are causing reptile species to become extinct. *Australasian Journal of Herpetology* 39:53-63.
- Hoser, R. T. 2022. Two new species of Cobra from South-east Asia (Serpentes: Elapidae: *Naja*). *Australasian Journal of Herpetology* 58:40-46.
- Ingle, M. 2020. Herpetofauna of the Amarkantak Plateau in central India. *IRCF Reptiles and Amphibians* 27(3):397-410.
- Janzen, P. 2022. Amphibians and Reptiles of Thailand Part 4: The northern part of the Thai Peninsula and again the Namtok Samlan NP. *Sauria* 44(1):13-32.
- International Commission of Zoological Nomenclature (ICZN) 1991. Decision of the commission. Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 48(4):337-338.
- International Commission of Zoological Nomenclature (ICZN) 2001. Opinion 1970. *Bulletin of Zoological Nomenclature* 58(1):74, (30 March 2001).
- International Commission of Zoological Nomenclature (ICZN) 2012. Amendment of Articles 8, 9, 10, 21 and 78 of the *International Code of Zoological Nomenclature* to expand and refine methods of publication. *Zootaxa* (PRINO) (Online) 3450:1-7.
- International Commission of Zoological Nomenclature (ICZN) 2021. Opinion 2468 (Case 3601) - *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, Elapidae) and *Australasian Journal of Herpetology* issues 1-24: confirmation of availability declined; Appendix A (Code of Ethics): not adopted as a formal criterion for ruling on Cases. *Bulletin of Zoological Nomenclature* 78 (30 April 2021):42-45.
- Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.
- Kaiser, H. 2012b. Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.
- Kaiser, H. 2013. The Taxon Filter, a novel mechanism designed to facilitate the relationship between taxonomy and nomenclature, vis-à-vis the utility of the Code's Article 81 (the Commission's plenary power). *Bulletin of Zoological Nomenclature* 70(4) December 2013:293-302.
- Kaiser, H. 2014a. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature*, 71(1):30-35.
- Kaiser, H. 2014b. Best Practices in Herpetological Taxonomy: Errata and Addenda. *Herpetological Review*, 45(2):257-268.
- Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.
- Kästle, W., Rai, K. and Schleich, H. H. 2013. *Field Guide to Amphibians and Reptiles of Nepal*. ARCO-Nepal e.V.:625 pp.
- Khoerunisa, I., Kusrini, M. D. and Mardiasuti, A. 2021. Diversity of snake rescued from residential areas in Greater Jakarta metropolitan area, Indonesia. *Media Konservasi* 26(3):231-238.
- Kinney, N. B. 1913. Banded Krait (*Bungarus fasciatus*) in Hyderabad State. *Journal of the Bombay Natural History Soc.* 22:635.
- Kopstein, F. 1938. Ein Beitrag zur Eierkunde und zur Fortpflanzung der Malaiischen Reptilien. *Bull. of the Raffles Museum* 14:81-167.
- Kuch, U. 1998. Fälle von Keratophagie bei einer Anden-Schlanknatter (*Alsophis elegans*), einem Bänderkrait (*Bungarus fasciatus*) und einem Vielbindenkrait (*Bungarus multicinctus*) mit einer Übersicht zur Keratophagie bei Schlangen. *Salamandra* 34(1):7-16.
- Kuch, U. and Schneyer, W. 1993. Erfahrungen bei der Terrarienhaltung von vier Arten nahrungsspezialisierter Giftnatter der Gattung *Bungarus* Daudin, 1803 Teil III. *Bungarus fasciatus* (Schneider, 1801). *Sauria* 15(1):27-37.
- Kuch, U., Kizirian, D., Nguyen, Q. T., Lawson, R., Donnelly, M. A. and Mebs, D. 2005. A new species of krait (Squamata: Elapidae) from the Red River System of Northern Vietnam. *Copeia* 2005(4):818-833.
- Laopichienpong, N., Muangmai, N., Supikamolseini, A., Twilprawat, P., Chanhom, L., Suntrarachun, S., Peyachoknagul, S. and Srikulnath, K. 2016. Assessment of snake DNA barcodes based on mitochondrial COI and Cytb genes revealed multiple putative cryptic species in Thailand. *Gene* Dec 15;594(2):238-247.
- Lenz, N. 2012. *Von Schmetterlingen und Donnerdrachen - Natur und Kultur in Bhutan*. Karlsruher Naturhefte 4, Naturkundemuseum Karlsruhe:124 pp.
- Leviton, A. E., Guinevere O. U. W., Koo, M. S., Zug, G. R., Lucas, R. S. and Vindum, J. V. 2003. The Dangerously Venomous Snakes of Myanmar Illustrated Checklist with Keys. *Proceedings of the California Academy of Sciences* 54(24):407-462.
- Mahabal, A. and Thakur, S. 2014. Instances of Aberrant colors and patterns among the Indian Herpetofauna: A review. *Russian Journal of Herpetology* 21(2):80-88.
- Mahony, S., Hasan, K., Kabir, M., Ahmed, M. and Hossain, K. 2009. A catalogue of amphibians and reptiles in the collection of Jahangirnagar University, Dhaka, Bangladesh. *Hamadryad* 34(1):80-94.
- Majumder, J., Bhattacharjee, P. P., Majumdar, K., Debnath, C. and Agarwala, B. K. 2012. Documentation of herpetofaunal species richness in Tripura, northeast India. *NeBio* 3(1):60-70.
- Majumder, R. 2022. Herpetofaunal community composition in an agro-ecosystem in the Gangetic plain of eastern India. *Zoology and Ecology* 32(2):122-132.
- Malkmus, R., Manthey, U., Vogel, G., Hoffmann, P. and Kosuch, J. 2002. *Amphibians and reptiles of Mount Kinabalu (North Borneo)*. A.R.G. Gantner Verlag, Rugell:404 pp.
- Malsawmdawngliana, B., Boruah, N. G., Patel, S., Lalronunga, I., Zosangliana, K., Lalmangaiha and Das, A. 2022. An updated checklist of reptiles from Dampa Tiger Reserve, Mizoram, India, with sixteen new distribution records. *Journal of Threatened Taxa* 14(10):21946-21960.
- Manthey, U. and Grossmann, W. 1997. *Amphibien und Reptilien Südostasiens*. Natur und Tier Verlag Münster, Germany:512 pp.
- Marshall, B. M. and Strine, C. T. 2019. Exploring snake occurrence records: Spatial biases and marginal gains from accessible social media. *PeerJ* 7 (PRINO) (Online):e8059.
- Martin, S. J. 1913. Banded Krait (*Bungarus fasciatus*) in Oudh. *Journal of the Bombay Natural History Society* 22:635.
- Mell, R. 1929. *Beiträge zur Fauna Sinica, IV: Grundzüge einer Ökologie der chinesischen Reptilien und einer herpetologischen*

- Tiergeographie Chinas*. Walter de Gruyter, Germany:ix+282 pp.
- Mell, R. 1930 Beiträge zur Lurch- und Kriechtierfauna Kwangsi's. *S. Ber. naturf. Freunde* 1929:310-332.
- Mitchell, F. J. 1948. A revision of the lacertilian genus *Tympanocryptis*. *Records of the South Australian Mus.* 9:57-86.
- Pandey, D. P. 2018. New records of snakes from Chitwan National Park and vicinity, Central Nepal. *Herpetology Notes* 11: 679-696.
- Pauwels, O. S. G., David, P., Chimsunchart, C. and Thirakhupt, K. 2003. Reptiles of Phetchaburi Province, Western Thailand: a list of species, with natural history notes, and a discussion on the biogeography at the Isthmus of Kra. *Natural History Journal of Chulalongkorn University* 3(1):23-53.
- Peters, W. C. H. 1863. Eine Übersicht der von Hrn. Richard Schomburgk an das zoologische Museum eingesandten Amphibien, aus Buchsfelde bei Adelaide in Südastralien. *Monatsber. königl. Akad. Wiss. Berlin*. 1863 (April):228-236.
- Prill, M. and Dehling, M. 2021. Amphibien und Reptilien des Bako-Nationalparks, Borneo. *Elaphe* 2021(5):38-49.
- Purkayastha, J. 2013. *An Amateur's Guide to Reptiles of Assam*. EBH Publishers (India).
- Purkayastha, J. 2018. Urban biodiversity: an insight into the terrestrial vertebrate diversity of Guwahati, India. *Journal of Threatened Taxa* 10(10):12299-12316.
- Purkayastha, J., Das, M. and Sengupta, S. 2011. Urban herpetofauna: a case study in Guwahati City of Assam, India. *Herpetology Notes* 4:195-202.
- Rabbe, M. F., Jaman, M. F., Alam, M. M., Rahman, M. M. and Sarker, M. A. R. 2022. Species diversity, composition, and distribution of the herpetofauna in the Northwestern Region of Bangladesh. *Amphibian and Reptile Conservation*, 16(1):226-234.
- Ratnarathorn, N., Harnyuttanakorn, P., Chanhome, L., Evans, S. E. and Day, J. J. 2019. Geographical differentiation and cryptic diversity in the monocled cobra, *Naja kaouthia* (Elapidae), from Thailand. *Zool Scr.* 2019:00:1-16.
- Rawat, Y. B., Bhattarai, S., Poudyal, L. P. and Subedi, N. 2020. Herpetofauna of Shuklaphanta National Park, Nepal. *Journal of Threatened Taxa* 12(5):15587-15611
- Ride, W. D. L. (ed.) et al. (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature*. The Natural History Museum - Cromwell Road, London SW7 5BD, UK.
- Russell, P. 1796. *An account of Indian serpents collected on the coast of Coromandel, containing descriptions and drawings of each species, together with experiments and remarks on their several poisons*. George Nicol, London, UK:90 pp.
- Saint Girons, H. 1972. Notes sur l'Ecologie des Serpents du Cambodge. *Zoologische Mededelingen* 47:65-87.
- Schneider, J. G. 1801. *Historiae Amphibiorum naturalis et literariae. Fasciculus secundus continens Crocodilos, Scincos, Chamaesauras, Boas. Pseudoboas, Elapes, Angues. Amphisbaenas et Caecilias*. Frommanni, Jena, Germany:374 pp.
- Schulz, K. -D. and Slegers, H. 1985. Erfolgreiche Haltung eines *Bungarus fasciatus* (Schneider, 1801). *Sauria* 7(2):3-4.
- Schulz, K. -D and Slegers, H. 1989. Erfolgreiche Haltung eines *Bungarus fasciatus*. *Litteratura Serpentium* 9(2):83-84.
- Shah, K. B. 1998. Checklist of the herpetofauna of Nepal with English and vernacular names. *NAHSON, Bull., Nat. Hist. Soc. Nepal, Kathmandu* 8(1-4):26-30.
- Sharma, R. C. 2004. *Handbook Indian Snakes*. Akhill Books, New Delhi, India:292 pp.
- Sharma, S. K., Pandey, D. P., Shah, K. B., Tillack, E., Chappuis, E., Thapa, C. L., Airol, E. and Kuch, U. 2013. *Venomous snakes of Nepal: a photographic guide*. B. P. Koirala Institute of Health Sciences, Dharan, Nepal:85 pp.
- Smith, M. A. 1914. Large Banded Krait. *Journal of the Natural History Society of Siam* 1:58-9.
- Smith, M. A. 1943. *The Fauna of British India, Ceylon and Burma, Including the Whole of the Indo-Chinese Sub-Region. Reptilia and Amphibia. 3 (Serpentes)*. Taylor and Francis, London, UK:583 pp.
- Stuebing, R. B. and Inger, R. F. 1999. *A field guide to the snakes of Borneo*. Natural history Publications (Borneo), Kota Kinabalu:254 pp.
- Stuebing, R. B., Inger, R. F. and Lardner, B. 2014. *A field guide to the snakes of Borneo, second edition*. Natural History Publications (Borneo).
- Supikamolsemi, A., Ngaoburanawit, N., Sumontha, M., Chanhome, L., Suntrarachun, S., Peyachoknagul, S. and Srikulnath, K. 2015. Molecular barcoding of venomous snakes and species-specific multiplex PCR assay to identify snake groups for which antivenom is available in Thailand. *Genet. Mol. Res.* 14:13981-13997
- Taylor, E. H. 1965. The serpents of Thailand and adjacent waters. *Univ. Kansas Sci. Bull.* 45(9):609-1096.
- Tenzin, J., Nidup, S., Gyeltsen, G., Tshomo, T., Nepal, A. and Wangyal, J. T. 2022. The herpetofauna in Sarpang District, Bhutan. *Taprobanica* 11(02):99-102.
- Teynie, A., David, P. and Ohler, A. 2010. Note on a collection of Amphibians and Reptiles from Western Sumatra (Indonesia), with the description of a new species of the genus *Bufo*. *Zootaxa* (PRINO) (Online) 2416:1-43.
- Thakur, S. 2011. A note on snakes of Kanha National Park and surrounding areas. *Reptile Rap* (11):2-4.
- Visvanathan, A., Anne, S., Kolli, A. K. and Vangari, S. M. 2022. Snakes of Telangana: An annotated checklist with new locality records and notes on natural history. *Reptiles and Amphibians* 29(1):279-285.
- Voris, H. K. 2000. Maps of Pleistocene sea levels in Southeast Asia: shorelines, river systems and time durations. *Journal of Biogeography* 27:1153-1167.
- Wall, F. 1905. Notes on Snakes collected in Cannanore from 5th November 1903 to 5th August 1904. *Journal of the Bombay Natural History Society* 16:292.
- Wall, F. 1906. The poisonous snakes of India and how to recognize them, Part I. *Journal of the Bombay Nat. History Society* 17:51-72 .
- Wall, F. 1908. A popular treatise of the common Indian snakes. Part VIII. *Journal of the Bombay Nat. History Society* 18: 711-735.
- Wallach, V., Williams, K. L. and Boundy, J. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. Taylor and Francis, CRC Press:1237 pp.
- Wang, K., Lyu, Z. T., Wang, J., Qi, S. and Che, J. 2022. Updated Checklist and Zoogeographic Division of the Reptilian Fauna of Yunnan Province, China. *Biodiversity Science* 30(4):21326:1-31.
- Wang, C. G. M. Z. X., Jia, S. Y. K. T. L. and Hu, C. Z. J. 2022. An updated species checklist of amphibians and reptiles in Fujian Province, China. *Biodiversity Science*, 22090.
- Wang, K., Ren, J., Chen, H., Lyu, Z., Jiang, X. G. K., Chen, J., Li, J., Guo, P., Wang, Y. and Che, J. 2020. The updated checklists of amphibians and reptiles of China. *Biodiversity Sci.* 28(2):189-218.
- Wangyal, J. T. 2019. *The status of herpetofauna of Bhutan*. District Forest Office, District Administration, Trashigang, Bhutan:19 pp.
- Whitaker, R. and Captain, A. 2004. *Snakes of India*. Draco Books:500 pp.
- Zeeb, S. 2012. Die Wirkung von Schlangengiften auf die Blutgerinnung und ihre Nutzung in der medizinischen Therapie und Diagnostik. *Draco* 13(51):58-66.
- Zhao, E. M. 2006. *The snakes of China*. Hefei, China, Anhui Science and Technology Publ. House, Vol. I, 372 pp., Vol. II (color plates), 280 pp.
- Zhao, E. and Adler, K. 1993. *Herpetology of China*. SSAR, Oxford/Ohio:522 pp.
- Ziegler, T. 2002. *Die Amphibien und Reptilien eines Tieflandfeuchtwald-Schutzgebietes in Vietnam*. Natur und Tier Verlag, Münster, Germany:342 pp.
- Zug, G. R. and Mitchell, J. C. 1995. Amphibians and Reptiles of the Royal Chitwan National Park, Nepal. *Asiatic Herpetological Research* 6:172-180.
- Zug, G. R. and Mulcahy, D. G. 2019. *Identification guide Amphibians and reptiles of South Tanimbari*. Fauna and Flora International:101 pp.

CONFLICTS OF INTEREST

None.