Australasian Journal of Herpetology **58:21-27.**
Published 28 June 2022.

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

Hiding in plain sight! Three new species of Slug Eater snakes (Serpentes: Colubroidea: *Duberria* Fitzinger, 1826) from South Africa.

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Received 1 May 2022, Accepted 20 May 2022, Published 28 June 2022.

ABSTRACT

Following from extensive fieldwork in South Africa in 2009, a detailed assessment of Slug Eater Snakes was performed across the range for all putative species within the genus *Duberria* Fitzinger, 1826, to assess the species-level taxonomy.

Based on molecular and morphological studies as well as disjunct distributions, the following taxa were recognized as full species *Duberria abyssinica* (Boulenger, 1894); *D. atriventris* (Sternfeld, 1912); *D. basilewskyi* (Skelton-Bourgeois, 1961); *D. lutrix* (Linnaeus, 1758) (type for genus); *D. rhodesiana* (Broadley, 1958); *D. shirana* (Boulenger, 1894); *D. variegata* (Peters, 1854).

D. lutrix sensu lato, (with a type locality of "Cape of Good Hope") long recognized as a potential species complex (e.g. Branch 2002, 2003), distributed almost entirely within South Africa was more recently found to consist of at least four potential species by Kulenkampff *et al*. (2019), with divergences from one another of between 1.23 and 3.42 MYA.

Examination of specimens within each identified clade yielded consistent morphological differences. As a result, this paper formally names the three unnamed forms from east of the Bedford Gap as new species in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999 as amended online since, via ICZN 2012).

While none of these species appears to be threatened, this situation may change suddenly in the wake of unknown factors, pest species or pathogens including as noted by Hoser (1991, 2019a, 2019b).

Keywords: Snakes; South Africa; Limpopo; Sabie; Port St. Johns; Bedford Gap; Slug eaters; *Duberria*; *abyssinica*; *atriventris; lutrix*; *basilewskyi; currylindahli; rhodesiana; shirana; variegata;* new species; *hoserae; woolfi*; *edwardsi*.

INTRODUCTION

In 2009, I engaged in fieldwork across South Africa, including the making of a TV documentary about South African reptiles. Most of the edited film work was stolen in an illegal armed raid on our Australian facility on 17 August 2011, as was most of the photos, field notes and the like created in 2009.

Notwithstanding this, when collecting snakes and also seeing others in collections, photos and the like, it rapidly became obvious that there was significant regional variation in the common species known as the Slug Eater, or *Duberria lutrix* (Linnaeus, 1758).

This variation in the putative species occurred across well known biogeographical breaks in the faunal elements of Western and Eastern Cape and led to further investigations of putative *Duberria lutrix*.

The taxonomic history of the genus *Duberria* Fitzinger, 1826 was that most forms were formally described as subspecies of the well-known *D. lutrix* (with a type locality of Cape of Good Hope, South Africa), which is also the first described and type species for the genus, some of which have since been synonymised with either *D. lutrix*, or other named subspecies.

Exceptional to this were *Homalosoma shiranum* Boulenger, 1894 and *Homalosoma variegatum* Peters, 1854, since transferred to the genus *Duberria* and mainly recognized as full species ever since.

With the status of populations of South African *D. lutrix* in question, as well as those elsewhere in Africa, it became prudent to inspect all putative taxa within the genus *Duberria* to see which species were valid, which needed to be synonymised, which taxa could be treated as subspecies and which if any taxa remained unnamed.

Parallel studies of snakes in the genus *Duberria* also assisted in answering relevant questions, enabling a proper genus-wide revision to be undertaken.

A stop on taxonomic studies and publications by myself with respect of the genus *Duberria* occurred after Bill Branch of South

Africa made it known in late 2009 that he intended naming one or more unnamed forms from east of the Bedford Gap in South Africa.

He had allegedly commenced working on the genus and relevant taxa in 2007 and so I deferred most further inquiries in favour of Branch.

I note that Branch's claim to be working on naming a species of *Duberria* in 2009 followed on from a major paper I had published on the African Cobras earlier that year (Hoser, 2009), which himself and best friend Don Broadley took exception to as it apparently breached a hegemony the two men had over herpetological publications on African reptiles.

That paper assigned spitting cobras to the newly named genus *Spracklandus* Hoser, 2019.

In the first instance, Branch and Broadley with good friends, Bryan Fry and Wolfgang Wüster claimed my science was rubbish and that spitting Cobras were perfectly placed within *Naja* Laurenti, 1768 (see for example Fry 2009, Wüster 2009a, 2009b).

Broadley and close friends Wolfgang Wüster and Van Wallach decided to overwrite the genus *Spracklandus* Hoser, 2019, with their own genus name *Afronaja*, Wallach, Wüster and Broadley, 2009, justifying their illegal action with a false claim that *Australasian Journal of Herpetology* was not published in accordance with the *international Code of Zoological Nomenclature* (Ride *et al*. 1999).

The lies by these men were exposed in Hoser (2012a) and again in Hoser (2012b, 2013, 2015a-f) as well as by Wellington (2015), by which stage the trio and others in their cohort had devised a new plan in the guise of Rhodin *et al*. (2015), which accepted the reality that *Spracklandus* was validly published, as were other names of myself published before 2009 and after that year.

The new plan was for an ICZN Plenary ruling declaring all "Hoser names" unavailable in science and to allow the so-called Wüster gang to be able to overwrite all Hoser names with those of themselves.

The ICZN rejected their application with a near unanimous vote against them and also affirmed the validity of *Spracklandus* having priority over the illegally coined *Afronaja* (ICZN 2021).

Meanwhile Branch died on 10 October 2018 at which time there was zero evidence to show he had done any significant work at all on the relevant species within *Duberria* or towards publishing any formal description of it.

Notable is that for many years he had despotic control over the journal of the Herpetological Association of Africa, in which he also published regularly, but nothing of relevance in terms of any formal description of any *Duberria* was published there.

Also notable is that Don Broadley died on 10 March 2016, effectively leaving a vacuum in terms of the formal naming of many still unnamed African reptiles and no further progress in terms of identifying and naming any overlooked species of *Duberria.*

Rather than seeing potentially overlooked species being extirpated through habitat destruction, pests, pathogens or any other form of benign neglect, the genus *Duberria* was assessed by myself with a view to identifying and naming any overlooked species.

MATERIALS AND METHODS

Inspection of original descriptions of each relevant putative species and subspecies was undertaken.

This in turn was combined with relevant morphological and molecular studies that have been published.

The known distributions were matched with known biogeographical barriers and areas of likely absence, to confirm that given populations were or were not interbreeding.

Finally relevant specimens, living, dead or from photos with good quality location data was inspected to confirm consistent differences and whether or not each form was distinct at either the species or subspecies level.

Literature relevant to the taxonomy and nomenclature of the genus *Duberria sensu lato* included Boulenger (1888, 1894), Branch (1993), Broadley (1958), Cowling *et al*. (2009), Daniels *et al*. (2009), Edwards *et al.* (2018), Engelbrecht *et al*. (2013), Fitzinger (1826), Hoser (2021), Kulenkampff *et al.* (2019), Laurent (1956), Linnaeus (1758), Loveridge (1936), Partridge and Maud (1987), Peters (1854), Portillo *et al*. (2018), Ride *et al*. (1999), Skelton-Bourgeois (1961), Spawls (2002), Sternfeld (1912), Theobald (1868), Joger *et al*. (2008), Wallach *et al.* (2014) and sources cited therein.

RESULTS

The molecular study of Kulenkampff *et al.* (2019) confirmed that there are at least four so-called cryptic species within South African *D. lutrix.*

Current taxonomy including for example Kulenkampff *et al.* (2019) treats all South African *D. lutrix* as a single subspecies, within nominate *D. lutrix*, with a type locality of Cape of Good Hope, just south of Cape Town, Western Cape, South Africa.

I inspected specimens from each of the four main clades of South African *D. lutrix* and was able to find consistent differences, enabling species level identification.

With no available synonyms for any of the three forms other than for the fourth type form for *D. lutrix*, all three others are formally named herein as new species in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999, as amended online since, via ICZN 2012).

Edwards *et al*. 2018 (as published at: http://biodiversityadvisor.sanbi.org/wp-content/uploads/2018/11/7_Phylogenetic-relationships-in-the-slug-eater-snakes-Duberria.pdf) provided evidence to show that the following taxa (as identified by themselves below) should be recognized as full species, being:

D. rhodesiana

D. shirana

D. variegata

D. lutrix lutrix

D. l. atriventris

D. l. abyssinica

D. l. basilewski

In spite of finding all diverged from one another at least 6 MYA, they did not formally elevate the letter three putative subspecies to the level of full species.

They did not analyse sequences of the putative taxon *D. currylindahli* (Laurent, 1956), but as it was collected proximally to their "*D. l. atriventris*" it is safe to contend that it is conspecific.

Within each of the above putative species, Edwards *et al*. (2018) found no major divergences within populations, except for within their South African "*D. lutrix lutrix"* which effectively matched the later published results of Kulenkampff *et al.* (2019).

Cyclophis catenatus Theobold, 1868 was synonymised by Boulenger (1894) with the type form of *D. lutrix* (from Western Cape), confirming the lack of availability of names for the other South African forms.

TAXONOMIC ACTIONS

On the basis of the preceding the genus *Duberria* Fitzinger, 1826 is herein treated as having ten species and no subspecies.

These are:

Duberria abyssinica (Boulenger, 1894)

D. atriventris (Sternfeld, 1912)

D. basilewskyi (Skelton-Bourgeois, 1961)

D. lutrix (Linnaeus, 1758) (type for genus)

D. rhodesiana (Broadley, 1958)

D. shirana (Boulenger, 1894)

D. variegata (Peters, 1854).

and three forms formally named for the first time below, being:

D. hoserae sp. nov.

D. woolfi sp. nov.

D. edwardsi sp. nov.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

In terms of the descriptions that follow, the following should be noted:

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, spellings 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 (ICZN).

This includes if gender assignment of suffixes seems incorrect, Latinisation is wrong, apparent spelling mistakes and so on (see Article 32.5.1 of the Code).

In the unlikely event two or more newly named taxa are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (fourth edition) (Ride *et al.* 1999) as amended online since.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 18 May 2022 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

Any online citations within this paper, including copied emails and the like, are not necessarily cited in the references part of this paper and have the same most recent viewing date as just given.

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

SVL or SV means snout-vent length, TL means tail length,

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant genera, subgenera, species or subspecies 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.

DUBERRIA HOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:24F4E38E-4819-4F4A-8DBA-7C187C9B7078

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University. Cambridge, Massachusetts, USA, specimen number MCZ:Herp:R-41954 collected from Woodbush, Pietersburg district, Limpopo, South Africa, Latitude -23.9, Longitude 29.45 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Comparative Zoology, Harvard University. Cambridge, Massachusetts, USA, specimen number MCZ Herp R-41953 collected from Haenertsburg, Pietersburg district, Limpopo, South Africa, Latitude -23.933 S., Longitude 29.95 E.

Diagnosis: Until now, all three species *Duberria hoserae sp. nov.* from Limpopo, South Africa, *D. woolfi sp. nov.* from the vicinity of Sabie, Mpumalanga, South Africa and *D. edwardsi sp. nov.* from coastal regions between East London and Sodwana Bay on the Eastern Cape of South Africa (and potentially slightly north of there) have been treated as populations of *Duberria lutrix* (Linnaeus, 1758), or alternatively of a nominate subspecies of that form being populations of *Duberria lutrix lutrix.*

Type *D. lutrix* is from the Cape of Good Hope, Western Cape, South Africa and this species as defined herein is found from around Cape Town along the coast and nearby as far east the area of Grahamstown, where it is separated from *D. woolfi sp. nov.* by the biogeographical barrier known as the Bedford Gap, which sits between Grahamstown and Port Elizabeth, extending from further inland as an arid intrusion separating the relevant populations.

The arid intrusion is caused by a break in the fold ranges funnelling hot dry air through the area when winds come from the north in warmer months.

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

D. lutrix (*sensu stricto*) is readily identified by being a dark chocolate brown dorsally with well defined dark greyish black on the flanks, the mid dorsal line consists only of scattered dots, well separated and mainly only on the anterior end of the body. Head is medium grey all over the top and sides. There is a slight lightening in the upper labials of some specimens.

D. hoserae sp. nov. is a distinctive light yellow brown dorsally, with a well defined, relatively thick and unbroken blackish mid dorsal stripe anteriorly, becoming broken as large thick dots on the mid body and posterior to this. Flanks are blackish with a well defined upper edge. Head brown but with a greyish tinge.

D. woolfi sp. nov. has a copper brown dorsum, except for the head which is dull brown. Upper flanks are black, with ill defined upper boundary and lower flanks grading to whitish, again with an ill defined boundary. The mid dorsal line is indistinct, consisting of tiny semi-distinct closely spaced greyish spots extending from nape to tail.

D. edwardsi sp. nov. is dull brown or reddish-brown above, with slightly darker flanks that are also brown and bounded at the top by a semi-distinct white boundary, this feature being unique to this species as compared to the other three above. Head is slightly darker than the body. Upper labials, especially at the rear are either whitish, or whitish-yellow. That the flanks do not form obvious dark blackish lines is a common distinguishing feature of adults of this species, this trait usually only being seen in extremely aged specimens of the other three species detailed above.

The four preceding species are separated from other six species in the genus *Duberria* Fitzinger, 1826, being *Duberria abyssinica* (Boulenger, 1894), *Duberria atriventris* (Sternfeld, 1912), *D. basilewskyi* (Skelton-Bourgeois, 1961), *D. rhodesiana* (Broadley, 1958), *D. shirana* (Boulenger, 1894) and *D. variegata* (Peters, 1854). by the following suite of characters; the dorsal colouration of yellowish brown to dark brown, usually with a broken mid-dorsal line of some kind that is usually consisting of numerous spots; distinctively grey to brown flanks, generally distinct, or if not so, with some kind of upper border; the venter is cream with a dark dotted line; 116-142 ventrals; two postoculars.

Snakes in the genus *Duberria* are separated from all other African colubrid snakes by the following suite of characters: No enlarged grooved fangs (for injecting venom) in the upper jaw; smooth scales; short tail; pupil round; loreal shield either absent or tiny; nasal single; rostral small.

In turn the African colubrids are separated from all other African snakes by not being worm-like in form; head is somewhat distinct from the body; belly has transversely enlarged ventral scales; eyes well developed, movable and with a transparent spectacle; fewer than 50 mid-body scale rows; labials without deep, heat sensitive pits and no remnants of vestigial hind-limbs or pelvic spurs.

D. lutrix (*sensu stricto*) in life is depicted online at:
https://www.inaturalist.org/observations/9409272
and
https://www.inaturalist.org/observations/42930489
D. hoserae sp. nov. in life is depicted online at:
https://www.inaturalist.org/observations/56108457

D. woolfi sp. nov. in life is depicted online at:
https://www.inaturalist.org/observations/113315675
D. edwardsi sp. nov. in life is depicted online at:
https://www.inaturalist.org/observations/10850565
Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. hoserae sp. nov.* of 3.42 MYA from other putative *D. lutrix*, including what is identified herein as *D. woolfi sp. nov.* and *D. edwardsi sp. nov.*.
Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. woolfi sp. nov.* of 2.05 MYA from other putative *D. lutrix*, including what is identified herein as *D. edwardsi sp. nov.*, but excluding *D. hoserae sp. nov.* from which it diverged 3.42 MYA.
Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. edwardsi sp. nov.* of 1.23 MYA from *D. lutrix* as defined in this paper and of 2.05 MYA and 3.42 MYA from *D. woolfi sp. nov.* and *D. hoserae sp. nov.* respectively.
Distribution: *D. hoserae sp. nov.* is only known from elevated regions of Limpopo, South Africa and based on the limited known range of the species, must be treated as an "at risk" species.
Etymology: The species *D. hoserae sp. nov.* is named in honour of my long-suffering wife, Shireen Hoser, born in the wild back blocks of Athlone, Cape Town, South Africa in recognition her many contributions to the herpetology of Africa, Australia and elsewhere.

DUBERRIA WOOLFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:CBA848B1-DDE3-43C7-A146-394B24547E37

Holotype: A preserved specimen in the Port Elizabeth Museum Reptile Collection, Gqeberha (Port Elizabeth), South Africa, specimen number PEM R 22549 collected from Sabie. Mpumalanga, South Africa . Latitude 25.501990 S., Longitude 30.473158 E.
This facility allows access to its holdings.
Paratype: A preserved specimen in the Port Elizabeth Museum Reptile Collection, Gqeberha (Port Elizabeth), South Africa, specimen number PEM R 22550 collected from Sabie. Mpumalanga, South Africa . Latitude 25.501990 S., Longitude 30.473158 E.
Diagnosis: Until now, all three species *Duberria woolfi sp. nov.* from the vicinity of Sabie, Mpumalanga, South Africa, *D. hoserae sp. nov.* from Limpopo, South Africa and *D. edwardsi sp. nov.* from coastal regions between East London and Sodwana Bay on the Eastern Cape of South Africa (and potentially slightly north of there) have been treated as populations of *Duberria lutrix* (Linnaeus, 1758), or alternatively of a nominate subspecies of that form being populations of *Duberria lutrix lutrix.*
Type *D. lutrix* is from the Cape of Good Hope, Western Cape, South Africa and this species as defined herein is found from around Cape Town along the coast and nearby as far east the area of Grahamstown, where it is separated from *D. woolfi sp. nov.* by the biogeographical barrier known as the Bedford Gap, which sits between Grahamstown and Port Elizabeth, extending from inland as an arid intrusion separating the relevant populations.
The arid intrusion is caused by a break in the fold ranges funnelling hot dry air through the area when winds come from the north in warmer months.
The four species are separated from one another by the following unique suites of characters:
D. lutrix (*sensu stricto*) is readily identified by being a dark chocolate brown dorsally with well defined dark greyish black on the flanks, the mid dorsal line consists only of scattered dots, well separated and mainly only on the anterior end of the body. Head is medium grey all over the top and sides. There is a slight lightening in upper labials of some specimens.
D. hoserae sp. nov. is a distinctive light yellow brown dorsally, with a well defined, relatively thick and unbroken blackish mid dorsal stripe anteriorly, becoming broken as large thick dots on the mid body and posterior to this. Flanks are blackish with a well defined upper edge. Head brown but with a greyish tinge.
D. woolfi sp. nov. has a copper brown dorsum, except for the head which is dull brown. Upper flanks are black, with ill defined upper boundary and lower flanks grading to whitish, again with an ill defined boundary. The mid dorsal line is indistinct, consisting of tiny semi-distinct closely spaced greyish spots extending from nape to tail.
D. edwardsi sp. nov. is dull brown or reddish-brown above, with slightly darker flanks that are also brown and bounded at the top by a semi-distinct white boundary, this feature being unique to this species as compared to the other three above. Head is slightly darker than the body. Upper labials, especially at the rear are either whitish, or whitish-yellow. That the flanks do not form obvious dark blackish lines is a common distinguishing feature of adults of this species, this trait usually only being seen in extremely aged specimens of the other three species detailed above.
The four preceding species are separated from other six species in the genus *Duberria* Fitzinger, 1826, being *Duberria abyssinica* (Boulenger, 1894), *Duberria atriventris* (Sternfeld, 1912), *D. basilewskyi* (Skelton-Bourgeois, 1961), *D. rhodesiana* (Broadley, 1958), *D. shirana* (Boulenger, 1894) and *D. variegata* (Peters, 1854). by the following suite of characters; the dorsal colouration of yellowish brown to dark brown, usually with a broken mid-dorsal line of some kind that is usually consisting of numerous spots; distinctively grey to brown flanks, generally distinct, or if not so, with some kind of upper border; the venter is cream with a dark dotted line; 116-142 ventrals; two postoculars.
Snakes in the genus *Duberria* are separated from all other African colubrid snakes by the following suite of characters: No enlarged grooved fangs (for injecting venom) in the upper jaw; smooth scales; short tail; pupil round; loreal shield either absent or tiny; nasal single; rostral small.
In turn the African colubrids are separated from all other African snakes by not being worm-like in form; head is somewhat distinct from the body; belly has transversely enlarged ventral scales; eyes well developed, movable and with a transparent spectacle; fewer than 50 mid-body scale rows; labials without deep, heat sensitive pits and no remnants of vestigial hind-limbs or pelvic spurs.
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D. hoserae sp. nov. in life is depicted online at:
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D. woolfi sp. nov. in life is depicted online at:
https://www.inaturalist.org/observations/113315675
D. edwardsi sp. nov. in life is depicted online at:
https://www.inaturalist.org/observations/10850565
Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. hoserae sp. nov.* of 3.42 MYA from other putative *D. lutrix*, including what is identified herein as *D. woolfi sp. nov.* and *D. edwardsi sp. nov.*.
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Distribution: *D. woolfi sp. nov.* is only known from elevated regions in the vicinity of Sabie, Mpumalanga, South Africa and based on the limited known range of the species, must be treated as an "at risk" species.
Etymology: The species *D. woolfi sp. nov.* is named in honour

of Paul Woolf of Walloon, (Brisbane), Queensland, Australia, the foundation president of the Herpetological Society of Queensland Incorporated in recognition of his many contributions to herpetology globally over many decades.

DUBERRIA EDWARDSI SP. NOV.

LSIDurn:lsid:zoobank.org:act:0539ABDD-6AE5-442D-B9D0-BCDC79BBA811

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University. Cambridge, Massachusetts, USA, specimen number MCZ Herp R-42639 collected from Port St Johns, Pondoland, Eastern Cape Province, South Africa, Latitude -31.633 S., Longitude 29.533 E.

This facility allows access to its holdings.

Paratypes: Six preserved specimens at the Museum of Comparative Zoology, Harvard University. Cambridge, Massachusetts, USA, specimen numbers MCZ Herp R-42640-42645 collected from Port St Johns, Pondoland, Eastern Cape Province, South Africa, Latitude -31.633 S., Longitude 29.533 E.

Diagnosis: Until now, all three species *Duberria edwardsi sp. nov.* from coastal regions between East London and Sodwana Bay on the Eastern Cape of South Africa (and potentially slightly north of there), *D. hoserae sp. nov.* from Limpopo, South Africa and *D. woolfi sp. nov.* from the vicinity of Sabie, Mpumalanga, South Africa have been treated as populations of *Duberria lutrix* (Linnaeus, 1758), or alternatively of a nominate subspecies of that form being populations of *Duberria lutrix lutrix.*

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D. hoserae sp. nov. is a distinctive light yellow brown dorsally, with a well defined, relatively thick and unbroken blackish mid dorsal stripe anteriorly, becoming broken as large thick dots on the mid body and posterior to this. Flanks are blackish with a well defined upper edge. Head brown but with a greyish tinge.

D. woolfi sp. nov. has a copper brown dorsum, except for the head which is dull brown. Upper flanks are black, with ill defined upper boundary and lower flanks grading to whitish, again with an ill defined boundary. The mid dorsal line is indistinct, consisting of tiny semi-distinct closely spaced greyish spots extending from nape to tail.

D. edwardsi sp. nov. is dull brown or reddish-brown above, with slightly darker flanks that are also brown and bounded at the top by a semi-distinct white boundary, this feature being unique to this species as compared to the other three above. Head is slightly darker than the body. Upper labials, especially at the rear are either whitish, or whitish-yellow. That the flanks do not form obvious dark blackish lines is a common distinguishing feature of adults of this species, this trait usually only being seen in extremely aged specimens of the other three species detailed above.

The four preceding species are separated from other six species in the genus *Duberria* Fitzinger, 1826, being *Duberria abyssinica* (Boulenger, 1894), *Duberria atriventris* (Sternfeld, 1912), *D. basilewskyi* (Skelton-Bourgeois, 1961), *D. rhodesiana* (Broadley, 1958), *D. shirana* (Boulenger, 1894) and *D. variegata* (Peters, 1854). by the following suite of characters; the dorsal colouration of yellowish brown to dark brown, usually with a broken mid-dorsal line of some kind that is usually consisting of numerous spots; distinctively grey to brown flanks, generally distinct, or if not so, with some kind of upper border; the venter is cream with a dark dotted line; 116-142 ventrals; two postoculars.

Snakes in the genus *Duberria* are separated from all other African colubrid snakes by the following suite of characters: No enlarged grooved fangs (for injecting venom) in the upper jaw; smooth scales; short tail; pupil round; loreal shield either absent or tiny; nasal single; rostral small.

In turn the African colubrids are separated from all other African snakes by not being worm-like in form; head is somewhat distinct from the body; belly has transversely enlarged ventral scales; eyes well developed, movable and with a transparent spectacle; fewer than 50 mid-body scale rows; labials without deep, heat sensitive pits and no remnants of vestigial hind-limbs or pelvic spurs.

D. lutrix (*sensu stricto*) in life is depicted online at:

https://www.inaturalist.org/observations/9409272

and

https://www.inaturalist.org/observations/42930489

D. hoserae sp. nov. in life is depicted online at:

https://www.inaturalist.org/observations/56108457

D. woolfi sp. nov. in life is depicted online at:

https://www.inaturalist.org/observations/113315675

D. edwardsi sp. nov. in life is depicted online at:

https://www.inaturalist.org/observations/10850565

Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. hoserae sp. nov.* of 3.42 MYA from other putative *D. lutrix*, including what is identified herein as *D. woolfi sp. nov.* and *D. edwardsi sp. nov.*.

Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. woolfi sp. nov.* of 2.05 MYA from other putative *D. lutrix*, including what is identified herein as *D. edwardsi sp. nov.*, but excluding *D. hoserae sp. nov.* from which it diverged 3.42 MYA.

Kulenkampff *et al.* (2019) estimated a divergence of the clade identified herein as *D. edwardsi sp. nov.* of 1.23 MYA from *D. lutrix* as defined in this paper and of 2.05 MYA and 3.42 MYA from *D. woolfi sp. nov.* and *D. hoserae sp. nov.* respectively.

Distribution: *D. edwardsi sp. nov.* is only known from coastal regions between East London and Sodwana Bay on the Eastern Cape of South Africa, and potentially slightly north of there.

Etymology: The species *D. edwardsi sp. nov.* is named in honour of Euan Edwards of Robina, Gold Coast, Queensland, Australia, in recognition of his many contributions to herpetology globally over many decades, including significant field research in various parts of Africa as recently as 2022.

SUMMARY

The underestimation of species diversity in South Africa in 2022 within a common putative species *Duberria lutrix* (Linnaeus, 1758) is cause for concern. Two of the three newly described species appear to be range restricted in the north-east of South Africa in an area experiencing rapid human population growth and the corresponding habitat destruction that comes with this.

While all species within *Duberria* Fitzinger, 1826 seem to be partial to non-dense urbanisation and human disturbances of places they live in, rapid declines in previously “secure” or “common” species are common in the world as human mediated influences increase.

Hence it is important that not only are the range restricted populations of these species monitored closely for adverse changes, but other currently unrecognized species diversity needs to be formally identified and named as matter of urgency.

Formally identifying and naming taxa is of course the first and

most important step towards their long term conservation.

For decades, William Branch, employed at the Port Elizabeth Museum and Donald Broadley of Zimbabwe exercised a despotic form of hegemony over herpetology in southern Africa, in which as a pair, they literally monopolized the taxonomy and naming of new species in the region.

This was primarily ego driven and has had seriously adverse wildlife conservation outcomes in the same forms as outlined in Hoser (1989, 1991, 1993, 1996, 2007, 2012a, 2012b, 2015a-f, 2007, 2019a and 2019b) and Hawkeswood (2021).

Broadley died on 10 March 2016, closely followed by Branch on 10 October 2018.

In 2007 (allegedly) and again in 2009, Branch told others to keep their "hands off" *Duberria lutix* as he was supposedly going to be describing the Port St Johns population as a new species.

He made numerous threats to others. At times Branch militarised law enforcement officers against those he saw as rivals, as did Broadley in similar circumstances.

This they did by instigating illegal armed raids on the families and homes of their victims, usually followed by faked criminal charges and prosecutions.

Branch died before he made any concrete steps towards formally describing the Port St Johns population of putative *Duberria lutrix.* But over at least a decade he had successfully managed to monopolize the taxon and effectively freeze all substantive research on it.

He did the same for numerous other African reptiles.

This was neither good scientific practice or good for conservation.

If currently unrecognized southern African reptile species do become extinct, it will be a very sad legacy left by Bill Branch and Don Broadley.

In order to rectify the damage caused by both men over some decades I implore others to step into the vacuum they have created and to assist in the task of identifying and naming species of herpetofauna from southern Africa expeditiously and before any become extinct in the manner detailed in the case of Australian species documented in Hoser (2019a, 2019b).

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CONFLICTS OF INTEREST - NONE

Cite this paper as:

Hoser, R. T. 2022. Hiding in plain sight! Three new species of Slug Eater snakes (Serpentes: Colubroidea: *Duberria* Fitzinger, 1826) from South Africa. *Australasian Journal of Herpetology* 58:21-27.