

A new species of Night Adder (Serpentes: Viperidae) from central Africa.

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ABSTRACT

The six species of snake within the genus *Causus* Wagler, 1830 are all superficially morphologically similar and have therefore until now had a relatively stable taxonomic history at the genus level.

While six species are presently recognized (Uetz 2013), some of these are known to be composite (Ineich *et al.* 2006, Phelps 2010) and do in fact have available names for the relevant populations (McDiarmid *et al.* 1999).

The only exception to this is in terms of the species *Causus lichtensteini* Jan, 1859, which consists of two geographically separated populations. Inspection of specimens from both groups, including the relevant type material shows that the differences between the two populations are consistent and worthy of taxonomic recognition. As a result, the eastern population, that which is found east of the Dahomey Gap is herein formally described as *Causus perkinsi* sp. nov. in accordance with the Zoological Code (Ride *et al.* 1999).

Keywords: Viper; taxonomy; *Causus*; new species; *perkinsi*.

INTRODUCTION

The so-called Night Adders, genus *Causus* Wagler, 1830 are a pan-African group of vipers, divergent from the normal viperine body form.

Being of more slender colubrid-like physical attributes, the genus *Causus* as defined was long thought of as basal to the more typical vipers.

However several recent phylogenetic studies have found them to be rooted within the Viperinae (e.g. Pyron *et al.* 2011, 2013) and therefore recognized as a group within the Viperinae, defined as unique at the tribe level (Hoser, 2012).

While all species are morphologically similar in habit and form, one form is in fact divergent, this being *C. lichtensteini* Jan, 1859 as defined to date.

While all others have their distributional centres and preferred habitat in drier savannah zones of Africa, this species is primarily a wet forest inhabitant or alternatively found in very humid microhabitats.

It is also divergent from the others in *Causus* morphologically, the most obvious and easily seen divergence being the fact that the subcaudals are all single, or nearly so, in this species versus divided in all the others.

As a result of these differences, I do, as a matter of course propose separate recognition for the taxon group including *C. lichtensteini* Jan, 1859 at the genus or subgenus level as part the conclusion of a review of the genus.

Doing the ethical and correct thing, I hereby resurrect the available name *Dinodipsas* Peters, 1882 for this species group, recognizing them at the subgenus level within this paper.

However I do also note that it is highly likely that molecular studies, not yet done, will in fact show full generic recognition of

this taxon group may be more appropriate.

Because the genus name is in effect already "available", there is no formal need for me to redefine it here.

However as it was originally proposed in an old publication and not diagnosed in terms of other members of the genus *Causus* Wagler, 1830, I present a diagnosis for the genus name, recognized herein as a subgenus below.

Following on from a Field trip to Africa in 2009, it was decided to undertake an audit for the true Vipers on the continent to see if there were any obviously unnamed species level taxa.

The decision was made because of the number of allegedly undescribed species that were widely known to herpetologists and regularly appearing in the literature as "unnamed species" (e.g. Ineich *et al.* 2006, Phelps 2010).

Unnamed taxa within the large and diverse genus *Bitis* are dealt with in two other papers published at the same time as this.

In terms of the genus *Causus* as generally known, there are as of early 2013, just six species widely recognized (Uetz 2013).

With some of these are known to be composite (Phelps 2010), an audit was done to see which were in actual fact unnamed versus those which had been named previously and then relegated to synonymy.

It turned out that all supposedly undescribed species within Africa that I was readily able to identify, either by direct inspection or from statements in the literature, do in fact have available names for the relevant populations (McDiarmid *et al.* 1999).

In summary, there are in fact considerably more than six valid species of *Causus*!

The only exception to the above is in terms of the species

Causus lichtensteini Jan, 1859, not previously recognized by others as consisting more than one species, but which in my view does consist of two separate species level taxa.

These are two geographically separated populations.

Inspection of specimens from both, including the relevant type material, shows that the differences between the two populations are consistent and worthy of taxonomic recognition and at the species level. As a result, the eastern population, that which is found east of the Dahomey Gap is herein formally described as *Causus perkinsi* sp. nov. in accordance with the Zoological Code (Ride *et al.* 1999).

It is also noted that other barely distinguishable rainforest taxa of common ancestry separated by the Dahomey Gap have in the recent past been shown to be of different species by morphological and molecular data (Lenk *et al.* 1999 and sources cited therein).

I also note herein that inspection of the available type material publications for the taxa *C. lichtensteini* Jan, 1859 and "*Dinodipsas angulifera* Peters, 1882" showed that both were one and the same taxon.

Both conformed to the species from west of the Dahomey Gap in West Africa (*C. lichtensteini*) as evidenced by the size and shape of the supraoculars and parietal scales as well as a subcaudal count of 15 for the Peters animal, which fits within the range for the western species (*C. lichtensteini* Jan, 1859) but not the newly described species herein (*C. perkinsi* sp. nov.), which has a range of 17-22.

The configuration of dark and light scales in front of the eye in the Peters animal also conforms to the western species.

Published material relevant to the subgenus *Dinodipsas* Peters, 1882 as defined herein and the species *C. lichtensteini* and *C. perkinsi* sp. nov. including the taxonomic conclusions made within this paper include, Boulenger (1896), Branch (1993), Broadley (1991), Broadley and Cock (1971), Broadley and Cotterill (2004), Broadley and Howell (1991), Broadley *et al.* (2003), Burger *et al.* (2004), Chifundera (1990), Chirio and Lebreton (2007), Cope (1883), Corti *et al.* (2001), Dobiey and Vogel (2007), Duméril (1859), Hoser (2012), Hughes and Barry (1969), Ineich *et al.* (2006), Jacobsen (2009), Jan (1859), Lenk *et al.* (1999), Loveridge (1936, 1956), Mallow *et al.* (2003), McDiarmid *et al.* (1999), Pauwels and Vande weghe (2008), Pauwels *et al.* (2002), Peters (1882), Phelps (2010), Pitman (1974), Pyron *et al.* (2011, 2013), Rödel and Mahsberg (2000), Schmidt (1923), Spawls *et al.* (2001), Trape and Roux-Esteve (1995), Uetz (2013) and sources cited therein.

SUBGENUS *DINODIPSAS* PETERS, 1882

Type species: *Dinodipsas angulifera* Peters, 1882.

Diagnosis: A medium-sized (to 70 cm) but usually averaging 35-60 cm as adults, snake from Africa. Dorsal body colour ranges from bright leaf green to olive green, yellowish, brown or even dull orange, with some well-spaced chevron-like markings on the dorsum which may appear indistinct in some (usually older) specimens. There is a white inverted "V" marking on the posterior dorsum of the head extending well back on the neck and this is most visible in younger specimens. The scales on the first third of the body are usually edged with white to varying degrees giving a stippled effect. The venter is yellowish or cream with two or three distinct black crossbars across the throat region. The head is somewhat elongated with a rounded snout and nine large scales on the dorsum and when compared to members of the nominate subgenus *Causus* is more distinct from the neck. The body scales are velvety and feebly keeled with 15 dorsal mid-body scale rows. There are 135-156 ventrals, single anal and 15-24 single subcaudals.

The rostral is a little broader than deep, obtuse angled above and well visible from above, its upper portion not half as long as its distance from the frontal. Internasals are longer than the praefrontals, separated from the loreal, frontal is one and a third times as long as broad as long as its distance from the end of

the snout, as long as the parietals; two praeoculars, two postoculars and one or two suboculars separating the eye from the labials; 2+3 temporals, upper two of similar size, six upper labials (rarely, 7), 8-9 lower labials with four lower labials in contact with the anterior chin shields; posterior chin shields are very small. Two rows of elongate narrow shields separates the first ventrals and the labials.

Distribution: Africa, essentially in the sub-Saharan west and not in the far east or south of the continent.

Content: *Causus (Dinodipsas) angulifera* Peters, 1882 (type species) and *C. (Dinodipsas) perkinsi* sp. nov. (see below).

CAUSUS PERKINSI SP. NOV.

Holotype: Specimen number 11788 from Medje, Democratic Republic of Congo 2° 25' 0N, Long (DMS), 27° 18' 0E held at the American Museum of Natural History (AMNH). This is a government owned facility that allows access to its collection by scientists.

Paratypes: Specimen numbers: 11780-11787 from Medje, Democratic Republic of Congo 2° 25' 0N, Long (DMS), 27° 18' 0E held at the American Museum of Natural History (AMNH).

This is a government owned facility that allows access to its collection by scientists.

Diagnosis: *Causus perkinsi* sp. nov. is separated from the species *Causus lichtensteini* Jan, 1859, which it formerly would have been identified as, by the fact that at the anterior and posterior ends (excluding the tips), the supraocular scales are of equal width, rather than being noticeably wider at the rear. In *Causus perkinsi* sp. nov. the parietals are considerably longer than wide, versus as wide as long, or only minutely marginally longer than wide in *C. lichtensteini*.

The scalation in *Causus perkinsi* sp. nov. is essentially similar to *C. lichtensteini* in most respects, but does also have some consistent trend differences. In this species further diagnostic characters are as follows: 139-149 ventrals, 17-22 single subcaudals, dorsal scale row count of 15-15-11, with the only deviation from this number being 10 or 9 scale rows above the base of the tail. 6 Supralabials, 9 lower labials. 5-7 (usually 6) oculars, 2+3 temporal formula, 1-1 loreals, though rarely 2 on one or other side. The first and second upper temporals are as long combined as the first lower one.

The species *Causus perkinsi* sp. nov. is further diagnosed as follows: It is a medium-sized (to 70 cm total length) but usually averaging 35-60 cm as adults, snake from Africa found east of the Dahomey Gap. Dorsal body colour ranges from bright leaf green to olive green, yellowish, brown or even dull orange, with some well-spaced chevron-like markings on the dorsum which may appear indistinct in some (usually older) specimens. There is a white inverted "V" marking on the posterior dorsum of the head extending well back on the neck and this is most visible in younger specimens. The scales on the first third of the body are usually edged with white to varying degrees giving a stippled effect. The venter is yellowish or cream with two or three distinct black crossbars across the throat region. The head is somewhat elongated with a rounded snout and nine large scales on the dorsum and when compared to members of the nominate subgenus *Causus* is more distinct from the neck. The body scales are velvety and feebly keeled.

The rostral is a little broader than deep, obtuse angled above and well visible from above, its upper portion not half as long as its distance from the frontal. Internasals are longer than the praefrontals, separated from the loreal, frontal is one and a third times as long as broad as long as its distance from the end of the snout, as long as the parietals; two praeoculars, two postoculars and one or two suboculars separating the eye from the labials; 2+3 temporals, upper two of similar size, six upper labials (rarely, 7), 8-9 lower labials with four lower labials in contact with the anterior chin shields; posterior chin shields are very small. Two rows of elongate narrow shields separates the first ventrals and the labials.

In *Causus perkinsi* sp. nov. there is a slight darkening in colour running from the back of the upper jaw to the lower back of the eye (very indistinct in many specimens). This does not in any way progress beyond the eye to the snout, which is the condition seen in *C. lichtensteini*.

Distribution: *Causus perkinsi* sp. nov. is known from Nigeria eastward to western Kenya and south to northern Angola. Also known from scattered localities in Sudan, the Democratic Republic of Congo and northern Zambia.

Etymology: Named in honour of David Perkins, barrister and lawyer from Melbourne, Victoria, Australia in recognition of a magnificent career where he specialized in taking on cases that corrupt people in the Victorian government did everything they could to stop him from working on.

In the state of Victoria, corruption whistleblowers are hounded and harassed and forced to face fabricated criminal charges. Being stripped of the right to work, the whistleblowers are then unable to fund a legal defence and so are routinely convicted of offences they have not committed, this heinous act being perpetrated by ruthless government-backed legal teams funded with the limitless funds of the Australian tax-payer to destroy them in the state's courts of law.

In support of the fundamental human right of people to have a fair trial in the court system, Perkins has made huge sacrifices and taken on cases pro bono (without fee) in order to help justice prevail. In short this has meant he has done thousands of hours of mentally difficult legal work on behalf of less fortunate others.

Due to the inherent corruption in the Victorian legal system and the fact that a sizeable part of the judiciary is openly corrupt and has a total disrespect not just for truth, but even the law itself (see Hoser, 1995, 1999a and 1999b), it is not surprising that Perkins has lost more cases on behalf of whistleblowers than he has won.

However his magnificent efforts towards making the world a better place deserve recognition.

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CONFLICT OF INTEREST

The author has no conflicts of interest in terms of this paper or conclusions within.

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