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EIGHT NEW TAXA IN THE GENERA *PSEUDONAJA* GUNTHER 1858, *OXYURANUS* KINGHORN 1923 AND *PANACEDECHIS* WELLS AND WELLINGTON 1985 (SERPENTES:ELAPIDAE)

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ABSTRACT

This paper defines and names new taxa at the subspecies level within the broadly recognized species "*Pseudonaja textilis*" otherwise known as the "Eastern Brown Snake". It also formally names hitherto unnamed, but widely recognized subspecies of *P. guttata* (otherwise known as the Speckled Brown Snake) and *P. affinis* (otherwise known as the Dugite) and all also commonly known in Australia as "Brown Snakes". Furthermore a new subspecies of Taipan (*Oxyuranus scutellatus*) from Irian Jaya and western Papua as well as a hitherto unnamed subspecies of Papuan Blacksnake *Panacedechis papuanus* from the same general region are also formally identified and named.

The newly named taxa are: *Pseudonaja textilis cliveevatti* subsp. nov., *Pseudonaja textilis leswilliamsi* subsp. nov., *Pseudonaja textilis rollinsoni* subsp. nov., *Pseudonaja textilis jackyhoserae* subsp. nov., *Pseudonaja guttata whybrowi* subsp. nov., *Pseudonaja affinis charlespiersoni* subsp. nov., *Oxyuranus scutellatus adelynhoserae* subsp. nov. and *Panacedechis papuanus trevorhawkeswoodi* subsp. nov..

Furthermore, the north-west Australian Taipan is described within this paper as *Oxyuranus scutellatus andrewwilsoni* subsp. nov. in order to stabilize the nomenclature of the long-recognised taxon.

Keywords: Taxonomy, snake, elapid, Taipan, Brown snake, *Panacedechis*.

INTRODUCTION

The genus *Pseudonaja* Gunther, 1858 has been the subject of taxonomic debate and relative uncertainty for many years, with one species, "*modesta*" recently removed and placed in another genus by Wells in 2002 under the name "*Notopseudonaja*", a move that has gained fairly wide support from herpetologists based on work and papers published in the 1980's.

Also and almost without exception, it is accepted by most authors that the species *Pseudonaja textilis* as recognized in most herpetological texts comprises at least number of distinct regional subspecies and perhaps even more than one species (Gillam 1979).

Wells (2002) placed the "*textilis*" group outside the traditional genus *Pseudonaja* and instead placed it in the (resurrected by them) genus *Euprepiosoma* Fitzinger 1860. At the same time, he subdivided the genus "*Pseudonaja*" into groups broadly consistent with each of the well-known species taxa, effectively creating a series of monotypic or near monotypic genera as alluded to above. For these, Wells erected a number of new names, including "*Placidaserpens*" for *guttatus* and "*Dugitophis*" for *affinis*.

Depending on where the line is drawn for assigning different species to a genus, the Wells (2002) position may be sensible, even if a radical departure from the conservative position taken by other publishing herpetologists in Australia and their past texts including Cogger (2000), Cogger, Cameron and Cogger (1983), Ehmann (1992), Gow (1989), Hoser (1989), Wallach (1985) and Wilson and Knowles (1988).

However I accept that the proposition to "kill" the

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name "*Pseudonaja*" for the "Eastern Brown Snakes" will be difficult for many to accept, bearing in mind many herpetologists have lived with the name "*Pseudonaja textilis*" for most of their lives, hence in this paper the genus name "*Pseudonaja*" is retained for these snakes, noting that for *textilis* and related taxa, they may ultimately be assigned to a different genus, the only available name to date being that resurrected by Wells and Wellington. A similar view is held for other taxa within the broadly recognized genus "*Pseudonaja*" as recognized in the general texts of Cogger (2000), Hoser (1989) and others.

The ICZN code (or "Rules") as known, dated 1 January 2000, seeks stability of names when possible (Ride et. al. 2000) and to that extent, the use of the name "*Pseudonaja*" as broadly recognized is retained here.

In recent years, several variants of "*Pseudonaja textilis"* as broadly recognised have been formally named or resurrected from the synomymy of *textilis* in at least the subspecies category.

These are as follows:

- *Pseudonaja textilis textilis* (Dumeril, Bibron and Dumeril, 1858) the type (sub) species from Eastern NSW and nearby areas.
- *Pseudonaja textilis bicucullata* (McCoy, 1879) from Victoria and nearby parts of inland New South Wales, including Albury, Wagga Wagga and much of west and North-west NSW - a slightly smaller variant than the nominate subspecies. It's ventral patterning is usually not as distinct as seen in *P. textilis textilis.* It is also slightly less aggressive (on average) than the nominate form. Single subcaudals at the anterior end (usually a small number) is common in this taxa. See for example Annable (1985).
- *Pseudonaja textilis ohnoi* Wells and Wellington, 1985 from Central Australia. Believed to be restricted to the McDonnell Ranges of Central Australia. All divided subcaudals are normal for this taxa as is an unbroken iris.
- *Pseudonaja textilis pughi* Hoser, 2003 from eastern New Guinea and further separated from Australian *P. textilis* on the basis of dentition and juvenile colouration.

The proposition that these taxa should be recognized as subspecies and not full species is supported by the findings of Skinner et. al. 2005 (p. 569).

Generally recognized as being similar to *P. textilis*, but of distinct species are the following taxa:

- *Pseudonaja inframacula* (Waite 1925) from the Eyre Peninsula, SA and along coastal SA across to WA is now regarded to be sufficiently differentiated from *Pseudonaja textilis* and *P. affinis* to warrant recognition as a separate taxa at the species level. This recognition also follows on from an assessment of "*P. textilis*" from nearby areas.
- *Pseudonaja elliotti* Hoser 2003 is a species that was for many years confused with *P. textilis* and is known only from the far west of New South Wales, in the general region of Wilcannia. Differences from *P. textilis* include ventral colouration, eye size, lack of a distinct above eye-ridge and head scalation. Only two museum specimens, the holotype and paratype are known.
- *Pseudonaja affinis* (the Dugite) from south-west WA and nearby parts of SA, is a closely related taxa, long recognised as a different species.

OTHER SIMILAR GENERA AND GENERA RELEVANT TO THIS PAPER

Other genera of similar looking elapid snakes (e.g. *Pailsus*, *Oxyuranus* and *Cannia*) are separated by colouration, build, scalation and other physical characteristics. *Oxyuranus* is separated from *Pseudonaja* by a higher number of mid-body rows (usually 23, see below) and the genera *Pailsus* and *Cannia* are separated by colour (if not "Brown snakes") or mainly single subcaudals if "Brown snakes". *Pailsus* and *Cannia* also lack the distinctive anterior ventral blotches seen in most *Pseudonaja*.

Panacedechis is separated from the similar *Cannia* by colouration, in that adults are generally not "Brown", while *Cannia* are when sympatric with *Panacedechis*, or distinctly reticulated in scale pattern and colour in regions they occur in where colour may not be "brown" and they are not sympatric with any *Panacedechis.* They are also separated by MtDNA and Nuclear DNA properties.

Refer to Cogger (2000) and Hoser (1998b) for further information about separating these similar genera.

DIAGNOSIS OF *PSEUDONAJA TEXTILIS.*

For most *Pseudonaja textilis* and others in the species group as identified above, they all tend to share the following characteristics.

In dorsal colour, they may range from light tan, through dark brown, russet and orange to almost black, or any shade in between the preceding. The belly is usually cream or yellowish-orange with scattered darker blotches. Hatchlings vary between localities. However most have a black head and/or

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black markings on the head and nape, the black bars being either totally or partially divided to form two such bars. The juvenile pattern usually fades at about two years of age. In some specimens of the insular subspecies of *P. affinis tanneri* and *P. a. exilis* the colour change is reversed…light as juveniles and darkening with age. (Maryan and Bush, 1996).

In coastal areas of NSW and nearby places, young specimens are usually banded (black bands) all along the body with rare cases of adults retaining bands. In some areas, including west of Lithgow in New South Wales, young may be born with or without bands, even from the same clutch of eggs.

The species (as identified here) is known from all Australian States, however in the NT, it is only known from the McDonnell Ranges and adjacent areas to the north, including the Barkly Tableland, while a single specimen is known from WA (Gordon Downs, in the Kimberley District). In the other (Eastern) states the species is most common in wetter regions, although within these areas, they prefer open woodland and grassland type habitats, where they are sometimes extremely common and commonly the dominant snake species. The species does not occur in Tasmania, but as climate is not thought to be the sole limiting factor, the underlying reason could be that the species failed to migrate south fast enough following the last ice age before the rise of Bass Strait.

Unpublished findings by myself, based on a decade of research in Melbourne, indicates that *P. textilis* continues to move southwards in it's Victorian distribution range, including around Melbourne, at the leading edge of the southward migration, with the main impediment to the progress of the species being the dominance of other species, (especially the cannibalistic *Austrelaps superbus*) as opposed to any alleged climatic and temperature factors.

In *P. textilis*, the scales are smooth with 17 mid-body rows, 185-235 ventrals, a divided anal and 45-76 paired subcaudals. Occasionally the first (anterior) subcaudals may be single, although in some specimens of *P. textilis bicucullata*, up to ten or more single subcaudals may occur.

In most areas adults average about 1.5 metres, but in Coastal Queensland adults over 2 metres are common. In other regions, outside Queensland, 2 metre specimens do occur, but are regarded as uncommon.

This swift-moving diurnal species will usually flee if aroused, but if cornered will stand it's ground raise it's head and become highly aggressive which is as described in (Gillam 1979), including the cover image.

P. textilis and related species are highly dangerous taxa with toxic venom.

These species are one of the most common causes of snakebite deaths within Australia.

This reflects the fact that the "species" is tolerant of human habitation and in many areas has actually increased in numbers, particularly around the edges of the capital cities of Sydney, Melbourne, Adelaide and Brisbane. It is invasive and will move into severely degraded habitat.

The species feeds on vertebrates, including introduced mice (*Mus musculus*). 10-20 eggs are usually laid. Quotes in the literature of higher numbers may be communal laying's involving more than one animal that have been erroneously misinterpreted as single clutches.

Captive breedings here of *P. textilis bicucullata* (twice for the same venomoid female) have yielded clutch sizes of 10 then 8 (one clutch per season/ year, with eggs laid every two years only), while dissections of about 10 killed (by the public or roadkilled) adults across 10 years of this subspecies have tended to yield an average clutch size slightly in excess of 10, but ranging to about 16.

Other *Pseudonaja* are separated from *P. textilis* and closely related taxa (named above) by a suite of characters including scalation, and the colour of the buccal cavity (darker in the others, versus flesh colour with only some dark striations).

One of the most closely related taxon to *Pseudonaja textilis* are *Pseudonaja affinis* Gunther 1872 and *Pseudonaja tanneri* (Worrell 1961), (the latter of which is commonly regarded as a subspecies of *P. affinis*), both of which are separated from *Pseudonaja textilis* by having 19, instead of 17 mid-body rows, (Wilson and Knowles 1988).

Skinner et. al. 2005, reject the concept of subspecies of *P. affinis* for the forms found on islands off the western West Australian coast.

However below a subspecies of *P. affinis* is named and the argument in favour of this designation is regarded as compelling due to the consistent trend differences seen.

Photos of *Pseudonaja textilis* in life (as broadly recognized), are provided by Ehmann (1992), Gow (1989), Hoser (1989), and Mirtschin and Davis (1992), Storr, Smith and Johnstone (1986), Worrell (1970) and other authors.

Photos of other relevant taxa are provided in the text references cited at the end of this paper.

THE FORMAT OF THE DESCRIPTIONS OF NEW TAXA

Rather than detailing all previously described taxa in the broadly recognized genus "*Pseudonaja*", I refer

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readers to the references cited at the end of this paper. This is done for reasons of space constraints in this journal and a desire to avoid unnecessary words in terms of duplicating already known and available information.

In particular, Gillam 1979 separates most described species in the genus *Pseudonaja* (excluding *P. affinis* (and described variants)) and those features are adopted here as diagnostic for those taxa.

Likewise for more recent features as described by Skinner et. al. (2005) that are similarly adopted for all in the genus "*Pseudonaja*". It is therefore accepted that the taxa generally recognized as *P. nuchalis*, comprises at least three well-defined species, all of which have already been formally described and named, if not by Wells and Wellington, then previously.

These are the Southern "*P. nuchalis*" now known as *P. aspidorhyncha* McCoy (1879), that being the first available name under the ICZN rules (see Mengden 1985, p. 200), Orange, with Black head "*P. nuchalis*" (proper name not known) and Darwin "*P. nuchalis",* which retains the name *"P. nuchalis*" (see Mengden 1985, p. 200). There remains a question as to which of the available names should be applied to the Orange, with Black head "*P. nuchalis*", although it is probably *P. acutirostris* (Mitchell 1951). To ascertain the correct name for this third taxa, an inspection of available holotypes relegated to synonymy with *P. nuchalis* (in the past) needs to be done, although Mengden has done this already. Mengden (1985) wrote later that there were no available holotypes for any of the Darwin, Black-headed or southern morphs of *P. nuchalis* (contrary to his notations on page 200), but this clearly predated the publication and acceptance of Wells and Wellington 1985, which has described and named a plethora of "*nuchalis*" variants, including it seems at least two that fits the Orange, with Black head "*P. nuchalis*".

In what turned out to be the peer review period for this paper, Skinner published in January 2009 a paper on "*P. nuchalis*" and stated that he relied on article 24.2.2 of the 1999 ICZN rules, as "First reviser" to designate the Wells and Wellington name *P. mengdeni* to this otherwise not properly named taxon.

His reasoning was somewhat questionable and in essence relied on a personal preference for the person that Wells and Wellington had named the taxon after (Skinner 2009) as opposed to the other person Wells and Wellington named the same taxon after elsewhere in the paper, even though based on page/position priority, at least one other name (as identified by Skinner) did have priority.

However in spite of this situation, the name *P. mengdeni* should be referred to the relevant taxon under the ICZN's principle of stability of nomenclature.

Having said that, taxa as described in Hoser 2003a and Hoser 2003b are recognized here and those definitions are adopted for this paper, including definitions in references cited therein and original descriptions of those taxa.

Gillam 1979 stated that he regarded *P. textilis* as probably comprising several species. This view has been considered by myself, but excluding *P. elliotti* Hoser 2003, no other snakes grouped under *P. textilis* warrant being placed in another species, either named or unnamed. This view is supported by the evidence of Mengden (1985) and Skinner et. al. (2005).

A similar view may be taken in terms of the two populations until now assigned to the species *P. guttata* and the eastern and western populations of *P. affinis*, which while obviously different to one another, are not sufficiently differentiated to be separated at the full species level.

Hence a conservative approach has been taken here with the newly described forms being recognized merely as subspecies of the taxa *Pseudonaja textilis, P. affinis* and *P. guttata.*

Hence as a result of Skinner et. al. 2005 (and Skinner 2009, see below) and Hoser (2003), there are now ten well-defined and recognized species within the genus *Pseudonaja* as broadly defined.

These are:

P. affinis, *P. guttata*, *P. modesta*, *P. ingrami*, *P. textilis*, *P. inframacula*, 3 taxa currently assigned to *P. nuchalis* (see above)(*P. aspidorhyncha*, *P. nuchalis* and *P. mengdeni*) and *P. elliotti.*

For many taxa, including those detailed below, colour is often an important and obvious diagnostic tool.

However it's important to note that variations in specimens arise from age, health and position in the shedding cycle, that runs from 4-14 weeks in healthy snakes during active periods.

This does at times make separating taxa on the basis of colour occasionally problematic and hence as a procedure, is best avoided immediately pre and post slough.

Another variable is degeneration and colour "running" or "fading" in preserved snakes and these should be properly accounted for.

PSEUDONAJA ELLIOTTI HOSER 2003

Note that Skinner et. al. 2005 do not appear to have ever inspected either of the known specimens of *P. elliotti* Hoser 2003 or for that matter even read and

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referred to the paper Hoser (2003), even though it was known and available to them as of end 2003.

However a post on the EMBL Website at:

http://srs.embl-heidelberg.de:8000/srs5bin/cgi-bin/wgetz?-e+[REPTILIA-Species:'Pseudonaja_SP_elliotti']

written by Peter Uetz reads as follows:

"Comment: Likely to be synonymous with *P. textilis* (A. Skinner, pers. comm.).",

has been on that site since at least end 2004 (since moved to another server).

It is at stark variance with other authors such as Ehmann (1992) who have seen the taxa first hand. Uetz is a close associate of Wolfgang Wüster, in turn a good friend of convicted wildlife smuggler David John Williams, both of whom as a matter of course denies and criticizes anything Raymond Hoser says, regardless of merits, hence giving possible or partial explanation to the Uetz posting.

For example Uetz and Wüster have on their websites repeatedly noted with glee the failure of Cogger 2000 to list any Hoser 1998a *Acanthophis* taxa as valid, including for the New Guinea taxa, which by not being in Australia, would be automatically excluded from Cogger's books if only on the basis of distribution.

In terms of Cogger and *Acanthophis*, of greater significance is probably the personal animosity between Cogger and Richard Wells, spanning decades, coupled with the fact that one *Acanthophis* (*wellsi*), was named after Wells, causing Cogger some great consternation.

Returning to the issue of Uetz, Skinner and *P. elliotti*, it is important to stress that there is no evidence whatsoever to support the assertion "Likely to be synonymous with *P. textilis*" and hence it should be dismissed as deliberate misinformation designed to create confusion among persons who'd know no better.

Photos of holotype *P. elliotti* published online at: http://www.smuggled.com/psetex3.htm and elsewhere, including comparative shots with *P. textilis* from the same region, clearly shows the two are very different species. This would even be obvious to a lay person with little if any knowledge of snakes, let alone a scientist!

SKINNER 2009 AND THE OMISSION OF *PSEUDONAJA ELLIOTTI*

More notable is that Skinner (2009) lists all known *Pseudonaja* taxa, including known synonyms (or available names deemed junior synonyms of other taxa and/or nomen nudems). However excluded from his otherwise comprehensive treatment for the genus is *Pseudonaja elliotti* Hoser 2003 by means of any form of notation or reference.

Again based on the comments on the Uetz database website (cited above), it would appear that Skinner would have been aware of the taxon, or at least the description of the "purported taxon" if one took a negative view of the paper naming the taxon.

Certainly myself and fellow herpetologists Scott Eipper and Adam Elliott have been in regular contact with Skinner and co-workers, including supplying him with DNA material as cited in his 2009 paper and had referred him to the 2003 *Pseudonaja elliotti* description paper, meaning it'd be effectively impossible for him not to know of the paper.

Upon becoming aware of the Skinner 2009 paper, I e-mailed Skinner a request for the paper, on 9 Jan 2009, which was sent by him to me within days. After reading the paper and noting no references to *P. elliotti*, I sent him an e-mail on 12 January 2009 seeking answers to the obvious question.

The text read:

> "Adam, thanks for the paper.
>
> I just read it all and yes, it makes general sense, except for one
>
> very important omission and that was "Pseudonaja elliotti" Hoser 2003.
>
> Was there a reason for that?"

No reply was received and so a second e-mail was sent late in January, which in full is copied below:

> "Subject: Pseudonaja elliotti
>
> Date: Wed, 28 Jan 2009 19:21:55 -0800
>
> From: Raymond Hoser <adder@smuggled.com>
>
> Organization: Snakebusters - Australia's Best Reptiles
>
> To: adam.skinner@adelaide.edu.au
>
> BCC: adam@upmarketpets.com, R VHS Scott Eipper 1 <scott_eipper@hotmail.com>, scott_eipper@hotmail.com
>
> Adam, I don't know if you got my earlier e-mail querying you on the
>
> taxon, but the questions I never got answers to were as follows:
>
> 1 - Is there a reason it was ignored in your 2009 Pseudonaja paper?
>
> 2 - Have you looked at any of this taxon?
>
> Please let me know
>
> Thanks again.
>
> RAYMOND HOSER"

Skinner did not answer the e-mail, in spite of it being

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sent several times to the same address that got his prompt replies earlier.

In other words, it becomes uncertain whether or not the Uetz site comments are actually Skinners or alternatively another fraud perpetrated by Wüster, which would be in line with his general behavior and methods.

Another question arising, is why was Skinner now apparently dodging answering some very logical questions arising in the wake of the 2009 paper?

Regardless of how the comments attributed to Skinner got to be on the Uetz website, at the end of it all, the only issue of relevance is whether or not *P. elliotti* is a valid taxon at the species level and put simply, based on apparent sympatry with *P. textilis*, the undeniable evidence shows it is!

THE TRUTH HATERS

While referring to Wulfgang Wüster and close associates, Mark O'Shea, Bryan Fry and David Williams, mention should be made of their scandalous habits of continually criticizing all Hoser papers while at the same time bootlegging the key findings under the guise of "original research" and then publishing them in various journals that they usually have some sort of editorial control.

Then they set about making the findings out to be their own original findings, cross citing them among themselves, cross-referencing to earlier papers also bootlegging material from Hoser and continually claim credit for findings not their own.

As a rule they consistently refuse to cite the original work of Hoser as it predates their own poor quality papers, save perhaps for a baseless and scandalous attack through an internet chat forum or print journal in which they exercise editorial control and where balancing corrections can be forcibly removed or prevented.

Threats against journal editors have been made by Wüster and/or friends in writing by letters to the editors or even on internet chat forums that they control and as recently as mid 2008.

Editors and journals threatened by these people include from herpetological societies in Australia, the UK and the USA.

This plagiarisation of work by these men and their other illegal and unethical acts should be made as widely known as possible and they should be condemned for this.

They are not doing herpetology, science or wildlife conservation any services at all with their unethical activities that they try to masquerade as "science".

Plagiarisation (otherwise known as uncited theft of another person's work by failure to cite, then take credit for it) is one of the most contemptible acts of any so-called scientist.

An example of one of these sorts of papers is seen in Wüster et al. (2004), where they supposedly investigate the phylogeny of snakes in three genera, namely *Acanthophis*, *Oxyuranus*, and "*Pseudechis*", making findings similar to those of three earlier papers on the taxonomy of all three genera by Hoser and yet failing to properly cite or acknowledge the original Hoser findings and papers (namely, Hoser 1998a, 2000a and 2002).

That paper included for example the deliberate and scandalous failure to cite the definitive paper of Hoser 1998, that was the first to give a genus wide assessment and revision of *Acanthophis* taxonomy, which of course made similar findings to those these men were now claiming as their own discoveries. And that's before one looks at the many other similar papers on the relevant genera published in the previous decade by Hoser, that had caused the same men to bombard the internet with their own and "anonymous" postings deriding the Hoser findings as wrong and all Hoser taxa as "nomen nudem" when they in fact complied with the ICZN code in every case!

In this and later papers by the same authors, the men repeatedly make false claims of originality of findings made in terms of these three genera by themselves and at the same time continue to claim that the same earlier findings as made by Hoser and published years earlier are either wrong or lack evidence.

There is no doubt that following publication of this paper, these three men will seek to attack the key points of the paper via internet sites they control, including under multiple identities. Readers are advised to treat all such attacks with the disdain they deserve.

See Hoser (2001) for numerous other examples of these men's scandalous behavior, dishonesty and even scientific fraud, including direct quotes and citations of the offending material.

Perhaps brief mention should also be made of David John Williams (with serious convictions for wildlife smuggling and animal cruelty offences).

In early 2008, Wiliams was disqualified from an Accor Holiday Inns competition whereby a person nominates themself as an "everyday hero", with Williams making outlandish claims about himself allegedly saving lives in New Guinea.

Wüster, O'Shea and Williams encouraged people to rig the votes in favor of Williams, via the registration of e-mail addresses, multiple votes and the like so that he eventually received thousands of votes he wasn't entitled to, including many from the same IP Addresses, either his own, or effectively controlled

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by him.

The main basis of this was apparently false "yahoo mail" and other e-mail accounts they spent many hours registering and posting under.

As a result of this blatant dishonesty on the part of Williams and his associates, he was quite properly disqualified from the competition for vote rigging.

Also in 2007/8 Williams was involved in a scandal, whereby vials of snakebite anti-venom went missing in Papua New Guinea, the result being lives were lost due a lack of anti-venom. After the scandal broke it was revealed in March 2008 by respected Port Moresby pharmacist Richard McGuiness that David Williams himself had accessed and taken over 50 vials of anti-venom even though he is not and never has been a licenced qualified medical practitioner authorized to take and use these.

At several hundred dollars a vial in a country with little money and income, this represents a huge quantity and loss for the citizens of the country.

Williams was also a principal of Austoxin, his business that was operating in New Guinea and wound up in 1996 after it was revealed it was the biggest illegal wildlife smuggling racket in the country (PNG).

In March 1997, he was fined $7,500 with conviction for a series of culpable wildlife trafficking, possession and cruelty charges in the Cairns Magistrate's Court.

NAMING NEW TAXA AT THE SUBSPECIES LEVEL

For several reasons, it is important that unnamed taxa be formally named and that process is done here. A diagnosis of the species broadly known as *P. textilis* is given in Hoser (1989) and in more detail in Cogger 2000. For diagnoses of the species *P. affinis* and *P. guttata*, including separation from others in the genus "*Pseudonaja*", refer to the original descriptions, Cogger (2000), Gillam (1979), Skinner et. al. (2005), Storr, Smith and Johnstone (1986) . Definition of subspecies within the species *P. modesta*, has been deferred indefinitely pending an ongoing study by Skinner et. al. (see Skinner et. al. 2005).

The genus *Oxyuranus* is diagnosed by Cogger 2000 and the species *scutellatus* defined by authors as cited at the end of this paper.

The genus *Panacedechis* is diagnosed by Wells and Wellington 1985 and other authors, with the taxon *papuanus* being further defined by papers by authors as listed and cited at the end of this paper.

In the event that a subsequent worker decides that any two taxa named below are one and the same, then the first named taxa (in order in this paper) is to be the correctly assigned name by any "first reviser" under current ICZN rules.

Where allowable under the ICZN rules, superfluous descriptive information is generally omitted, with readers directed to seek reference from the designated holotypes and/or other specimens of the named taxa.

This has been done as a result of a desire to make this paper more readable and read by potential readers.

There is also a desire to keep this paper restricted to the most important and essential details.

Appropriate descriptions and diagnoses of the various new taxa follow:

PSEUDONAJA TEXTILIS CLIVEEVATTII SUBSP. NOV.

HOLOTYPE

A specimen from the Central Australian Museum, specimen number R546, collected at Wave Hill in the Victoria River District, NT, 17°27'S, 130°50'E.

DIAGNOSIS

Adult *Pseudonaja textilis cliveevatti* subsp. nov. are a darkish olive-brown dorsally with the fore body and head darker than the rest of the body. All other N.T. *P. textilis* are the same colour along the entire dorsal surface in adult snakes.

In *Pseudonaja textilis cliveevatti* subsp. nov. each dorsal scale is darker brown tipped. Markings on the venter are not necessarily as distinct as for other *P. textilis.*

Pseudonaja textilis cliveevatti subsp. nov. is restricted to the southern half of the Victoria River District, NT and adjacent parts of WA. A single specimen is known from Gordon Downs, WA. The colouration of adults of this taxa, separate them from other *P. textilis* in the Northern Territory (adjacent regions).

Pseudonaja textilis cliveevatti subsp. nov. is also separated from other *P. textilis* by distribution and is the only subspecies to range into Western Australia.

ETYMOLOGY

Named in honour of barrister Clive Andreas Evatt from Sydney, NSW. Unlike most lawyers who do nothing more than lie, cheat and thieve, Clive is a man of ethics and honour. He has taken on a number of important public interest cases at huge personal cost that otherwise may not have been litigated.

Of particular relevance to private reptile keepers, in 1996 Evatt and fellow lawyer, Michael Rollinson (see below) successfully fought the NSW National Parks and Wildlife Service (NPWS) and allies in three cases in the NSW Supreme Court to ban the newly

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published book, *Smuggled-2*. As a result of the good work of Evatt and Rollinson in making sure the public got to read the truth about wildlife trade in Australia, the attempts to ban the book failed (the last case finalized on 24 December that year and widely reported in the media at the time).

As a result of the publicity and the fact that the book was now legally being sold Australia-wide, the book became a best-seller and as a direct result of the publication of the book, the NSW and WA governments were then forced to remove more than 20 year-old bans on legal private ownership of reptiles, which came to fruition the following year (1997) in NSW and shortly thereafter in WA.

PSEUDONAJA TEXTILIS LESWILLIAMSI SUBSP. NOV.

HOLOTYPE

A specimen from the Northern Territory Museum, specimen number R5205, collected at Anthony's Lagoon, Barkly Tableland, NT, 17°59'S, 135°42'E.

PARATYPE

A specimen from the Northern Territory Museum, specimen number R5203, collected at Brunette Downs, NT, 18°39'S, 135°17'E.

DIAGNOSIS

Pseudonaja textilis leswilliamsi subsp. nov. is separated from other *P. textilis* by the fact that the iris is consistently a broken circle and that unlike the taxa *Pseudonaja textilis cliveevatti* subsp. nov. (see this paper) *Pseudonaja textilis leswilliamsi* subsp. nov. is the same colour along the entire dorsal surface (in adults) .

The iris colour is reddish-yellow with a narrow very pale inner edge. The iris width is about .08 of the eye diameter as opposed to .03-.06 in *P. textilis ohnoi*, which is the other subspecies found in the same general region, which is a consistent shade of brown along it's entire dorsal length. In *P. textilis ohnoi* the iris is usually an unbroken circle.

Pseudonaja textilis leswilliamsi subsp. nov. is the only subspecies of *P. textilis* found on the Barkly Tableland, NT. It is sepated from other N.T. *P. textilis* by the following traits: consistent dorsal colour to separate from *Pseudonaja textilis cliveevatti* subsp. nov. and broken iris to separate from *P. textilis ohnoi.*

ETYMOLOGY

Named in honour of Les Williams, a herpetologist from Ballan, on the outer-western outskirts of Melbourne, Victoria, Australia, for his long-term work with wildlife conservation and education.

In late 2007, he was diagnosed bowel cancer. Later he was found to have various secondary tumors and it had been hoped that he'd receive recognition while still alive. This paper was originally scheduled to by published in *Crocodilian* in mid 2008, but pressure was applied on the editors by truth-haters Mark O'Shea and David Williams, the result being the paper was "held over" pending the deletion of material that in any way adversely named truth haters David Williams and others, even if by way of peripheral reference. O'Shea even provided a sizeable "junk" article to fill the huge gap from the omission of this paper.

In the first instance it was agreed to investigate the possibility for such material being removed. However with the publication of the end 2008 issue of *Crocodilian* being delayed to mid 2009, due to unconnected circumstances (the editor resigned due to increased work commitments at his new pet shop, and no other editor had been appointed), it was decided to amicably withdraw the paper from *Crocodilian* and submit an uncensored version of the paper to *Australasian Journal of Herpetology*. Unfortunately Les Williams died in January 2009, before he could see the publication of this paper and the recognition for his life-long work with reptiles and their conservation.

Les Williams was not just a magnificent reptile handler and conservationist. He was also a truly wonderful human being who had a natural way with others including skills at teaching that others in similar roles could never match.

Williams continued free-handling his elapids to just days before his death, but it was the cancer that killed him, not any snakebites.

PSEUDONAJA TEXTILIS ROLLINSONI SUBSP. NOV.

HOLOTYPE

A specimen lodged at the National Museum of Victoria on 16 April 2008, by Raymond Hoser, specimen number: D.73622.

The snake is an adult male with 17 mid body rows, 190 ventrals, 59 strongly divided subcaudals (none single), 6 supralabials and 7 infralabials. It was caught live as a young Adult by Ian Renton, of "Snake-away" from Paradise, SA. The snake was acquired by myself in Melbourne shortly after capture in November 2005 and made "venomoid" on 6 Feb 2006, using the method described by Hoser (2004) and later papers.

It was offered a mouse immediately after the operation which it ate voluntarily, and likewise in days following the operation.

This is merely reported here as routine, and noting the minimal pain and discomfort from the operation in sharp contrast to the malicious and deliberate lies peddled on the internet by persons such as Shane Hunter, David Williams and associates.

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The snake failed to show any interest in mating with an adult female of the same taxon acquired at the same time and venomoided on the same date.

The male (the holotype) died suddenly on 20 September 2007. The cause of death was believed to be movement of a microchip inserted in March the same year.

The risks of microchip movements in snakes are well-known and such is common.

As a result of these known risks, none would have been placed in any Hoser snakes under normal circumstances.

As part of the long running anti-Hoser campaign by convicted smuggler, David John Williams and associates, these men managed to convince the Department of Sustainability and Environment (DSE) to direct (under threat of prosecution under the Wildlife Act 1975) myself to microchip all "venomoid" snakes.

This was done and as a result of this culpable direction by the DSE people, this snake (and about 40 others) were microchipped.

The corpse was lodged "entire" at the National Museum Victoria as the holotype for this newly described taxon.

As of the time of writing the final draft of this paper in mid 2008 (and during final revisions in early 2009), the female remained alive and well at the author's facility.

Both these snakes (and a regularly breeding pair), were depicted on the front cover of the Melbourne *Herald-Sun* newspaper on 13 February 2007 (Higginbottom 2007) also leading Williams and associated truth-haters to complain, including writing a letter to the *Herald-Sun* making further false and defamatory claims against myself..

PARATYPE

Specimen number 73532, from the Field Museum of Natural History, Chicago, USA, collected from south-east South Australia.

DIAGNOSIS

This taxon is most readily separated from all other *P. textillis* by it's relatively narrow rostral scale, that is relatively speaking and on average, is considerably narrower than is seen in all other *P. textilis.*

Pseudonaja textilis rollinsoni subsp. nov. is a smallish form of *P. textilis* restricted to the Adelaide hills and nearby regions of South Australia, including Adelaide city. It is the only subspecies known from this part of state, with *P. textilis* as a species being absent from most parts of South Australia, except the settled south-east.

Although the distribution of *Pseudonaja textilis rollinsoni* subsp. nov. abuts that of *P. textilis bicucullata* in western New South Wales and Victoria, *Pseudonaja textilis rollinsoni* subsp. nov. is similar in many respects to *P. textilis* from northern Australia and also specimens from the coast of NSW. It is substantially different in form from *P. textilis bicucullata* from Victoria and adjacent parts of inland NSW (that is, specimens from Melbourne and the Western slopes and plains of southern NSW).

Pseudonaja textilis rollinsoni subsp. nov. is separated from all other *P. textilis* by it's generally smaller venom glands (about ½ the size of those seen in *P. textilis bicucullata*) and an average venom yield of about 1/3 that of northern Australian *P. textilis* (including all other described subspecies of *P. textilis*).

The relative smallness of the venom glands in *Pseudonaja textilis rollinsoni* subsp. nov. is both a function of the smaller average size of this taxon and also relative at a given (same size) of specimens.

On average snakes of this taxon have smaller narrower heads and more gracile builds than other *P. textilis.*

In line with all other *P. textilis*, save for *P. textilis bicucullata* (on many occasions), *Pseudonaja textilis rollinsoni* subsp. nov. will constrict or hold it's prey in several coils immediately after striking it (as a rule).

Pseudonaja textilis rollinsoni subsp. nov. is typically faster moving and more highly strung (inclined to strike and bite) than *P. textilis* from other parts of Australia.

Ventrally, *Pseudonaja textilis rollinsoni* subsp. nov. has a particularly well-defined pattern of blotches and marks on the forebelly, which is on average better defined than in other regional variants of *P. textilis*. (*P. textilis bicucullata* (in most specimens) has the least well defined ventral pattern of the various named subspecies).

The rear belly of *Pseudonaja textilis rollinsoni* subsp. nov. is typically a reddish brown colour, as opposed to a creamish brown seen in most specimens of other subspecies of *P. textilis*, making this feature another character diagnostic of this subspecies.

All specimens of *Pseudonaja textilis rollinsoni* subsp. nov. have divided subcaudals, which is in contrast to *P. textilis bicucullata* (found in Victoria and NSW) which commonly has one or more anterior subcaudals single.

Distribution is a good means to identify *Pseudonaja textilis rollinsoni* subsp. nov. as it is the only *P. textilis* known from the north Adelaide region of South Australia, but it is uncertain how far, north and east of this region this taxa extends beyond the Adelaide Hills area.

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Adult female ***Pseudonaja textilis rollinsoni*** **subsp. nov.** Aged about seven years old. Photo: Raymond Hoser.

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Due to different ventral scalation and colouration, *Pseudonaja textilis rollinsoni* subsp. nov. is easily separated from *P. textilis bicucullata*. *Pseudonaja textilis rollinsoni* subsp. nov. is separated from all other *P. textilis* by it's relatively smaller venom glands, rear ventral colouration (more reddish brown than other *P. textilis*), more gracile build and generally faster movements.

CAPTIVITY NOTES

As captives, *Pseudonaja textilis rollinsoni* subsp. nov. are regarded by most keepers as intractable in that they do not tame down and remain aggressive to humans.

This is not strictly the case, but appears to be more true for this subspecies than other *P. textilis*.

A wild caught pair including a male and female specimen received from Adelaide at end 2005 (caught three weeks prior) remained highly strung and aggressive for some weeks, but fed and thermoregulated like perfectly well-adjusted captives from within 48 hours of being placed in cages at my facility.

Both were made venomoid (see Hoser 2004 and Hoser 2005) in late 2005 and had incident free husbandry until late 20 September 2007, when the male in apparently perfect health, died suddenly and without warning or obvious explanation. It was found on it's back, indicating a painful and sudden death.

An inspecting veterinary surgeon advised that the likely cause of death was movement in a microchip implanted in March 2007 under duress by us and on direction of the State Wildlife authority (called the Department of Sustainability and Environment, or DSE) under threat of prosecution for non-compliance.

The order to microchip was made following an online petition against Hoser venomoids orchestrated by Williams, Wüster and associates, whose sole agenda was against Hoser and reptile conservation in general combined with their non-stop complaints to DSE and other authorities leading DSE officials to complain that they had to act "to be seen to be doing something".

Ironically, while the online petition and associated website made false claims against the Hoser venomoids, including that false allegation that mouth's were superglued to prevent bites, and claimed animal welfare as the basis of the campaign against Hoser, contrary to animal welfare protocols, the snakes were forcibly microchipped for no good reason or benefit to the snakes and with total disregard for welfare considerations.

While potential movement of micro-chips in chipped snakes hasn't been monitored in the over 40 snakes microchipped (most of which remain alive and well), some movement of chips has been casually observed either directly, or during subsequent scans of snakes showing chips to have moved to locations other than where implanted.

No other wildlife demonstrators in Victoria (about 40 licenced) were directed to jeopardize the welfare of their snakes or forced to microchip any of their elapid snakes.

The direction to forcibly microchip the snakes was in violation of the Wildlife Act Victoria (1975) and the Prevention of Cruelty to Animals Act Victoria, which prevents any act of pain or suffering to be inflicted on an animal without measurable health and welfare benefits.

As of early 2008, the female *Pseudonaja textilis rollinsoni* subsp. nov. remained in good health.

Contrary to false claims made by Wüster, Williams, Fry, O'Shea and/or their friends on the internet and elsewhere, there was no regeneration of venom or venom glands in the deceased male snake (mentioned above) or other Hoser venomoids long after the operation.

Videos were made in early 2008, including by *The Age* newspaper on 9 April 2008 of long-term venomoids, including *Pseudonaja textilis* and Inland Taipans (*Parademansia microlepidota*) being forced to bite myself to prove that the snakes have no venom and the bites have no ill-effects.

BREEDING

A male *P. textilis bicucullata* was as of end December 2005 trying to mate with a female *P. textilis bicucullata* and after three days was unable to connect, in spite of non-stop trying.

This snake was placed with the female *Pseudonaja textilis rollinsoni* subsp. nov. but showed no interest in mating her.

The reaction between the two snakes was more akin to that seen when different taxa are mixed (as in Tigers and Browns), which is something I've been able to do because most snakes at my facility are venomoid (see Hoser 2004 or Hoser 2005).

With time, it is possible to have *Pseudonaja textilis rollinsoni* subsp. nov. and all other *P. textilis* so tame that they can be "free-handled" without biting, but this is only recommended for venomoids.

While most *Pseudonaja textilis rollinsoni* subsp. nov. are smallish (average under 1.2 metre as adults), specimens up to 2 metres are known.

The male did not show any interest in mating with the female at any stage, in spite of the same husbandry regime resulting in repeated successful breedings of *P. textilis bicucullata* at the same facility. This was the case for the entire time the

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snake was kept and in spite of a good overwinter cooling for this and other elapids at the facility.

The male was inspected in Aug/Sept 2007 and seen to be producing viable semen, that was inspected under a microscope and cleared as viable with active motile spermatozoa.

It was hoped to trial artificial insemination on these snakes using the method detailed in Hoser 2008a. However the unexpected death of the male on September 2007 prevented this from occurring.

The same method of artificial (or assisted) insemination did however succeed in producing other newborn reptiles, including Tiger Snakes and Eastern Bluetongues in a world first.

(In the same 2007/8 breeding season, the Hoser facility produced Blotched Bluetongues and a second litter of Tiger Snakes by "Natural" means).

ETYMOLOGY

Pseudonaja textilis rollinsoni subsp. nov. is named in honour of barrister Michael Rollinson from Sydney, NSW. Unlike most lawyers who do nothing more than lie, cheat and thieve, Michael is a man of ethics and honour. Often working closely with Clive Evatt, he has taken on a number of important public interest cases at huge personal cost that otherwise may not have been litigated, see above.

***PSEUDONAJA TEXTILIS JACKYHOSERAE* SUBSP.NOV.**

HOLOTYPE

Specimen number R147652 from Merauke, Irian Jaya, Lat 8º 30' Long 140º 20', at the Australian Museum, Sydney, lodged by J. Scott Keogh in 1995.

PARATYPE

Specimen number R147659 from Merauke, Irian Jaya, Lat 8º 30' Long 140º 20', at the Australian Museum, Sydney, lodged by J. Scott Keogh in 1995.

DIAGNOSIS

There are consistent differences in colour between *Pseudonaja textillis pughi* Hoser 2003 populations from eastern PNG and *Pseudonaja textilis jackyhoserae* subsp. nov. from Merauke. *Pseudonaja textilis jackyhoserae* subsp. nov. are olive or tan or mid-brown, whereas *Pseudonaja textillis pughi* Hoser 2003 tend to be a distinct dark grey-brown to almost black.

Pseudonaja textilis jackyhoserae subsp. nov. is the Eastern Brown Snake known from Merauke and nearby areas of island New Guinea in the territory of Indonesian Irian Jaya.

It is separated and clearly different to the eastern New Guinea populations, originally described and known as *Pseudonaja textillis pughi* Hoser 2003. *Pseudonaja textillis pughi* Hoser 2003 is apparently separated from this newly described subspecies by distribution.

The present-day swamplands of the Gulf of Papua coast appear to be a barrier separating the two subspecies populations. (The same area apparently acts as a barrier between the two distinct forms of Taipan found in island New Guinea as well).

At the time of the description of *Pseudonaja textillis pughi* Hoser 2003, it was assumed that all Eastern Brown Snakes from island New Guinea would as a matter of logic be assigned to the taxon on the theoretical basis that the taxon would have unfettered access across the island. In Australia, the species ranges across various habitats and great distances, including habitats comparable with those evident in New Guinea.

However investigations by this author into Taipans from island New Guinea, revealed two distinct forms (namely that from most of southern Papua, versus that from Merauke, Irian Jaya and nearby (being the entire range of Taipans to include the area west of the Fly River drainage in PNG), the latter form being in some ways more closely related to those from northern Australia, as opposed to *O. s. canni*, which should herein be used only for the population east of the Gulf of Papua).

The differences between the eastern and western Taipans in island New Guinea are sufficient to warrant separation at least to the subspecies level and hence the unnamed western taxon is named formally below.

Similar inquiries into the *P. textilis* from Merauke, Irian Jaya, led to the inescapable conclusion that these snakes are sufficiently different from the eastern snakes to be regarded as a different taxon, at least to the subspecies level, hence the naming of the taxon *Pseudonaja textilis jackyhoserae* subsp. nov..

Noting the physical position of Cape York and north-west Australia to island New Guinea, in combination with the position of the gulf of Papua, questions arise in terms of the origins of the New Guinea populations of *P. textilis* and *O. scutellatus* and whether they arose at the same time.

One scenario proposed is that for these genera two separate migrations occurred to New Guinea at the same time, and during the last ice age, (the Pleistocene) ending within the last 12 thousand years, perhaps across two separate land bridges. An alternative scenario is that the origins of the snakes east of the Gulf of Papua predate the end of the last ice-age. That is that those snakes derive from earlier stock and an earlier "invasion", hence their sharper differentiation from known and present Australian stock. This implies that the latter stock

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as seen near Merauke in Irian Jaya crossed to the region either near Cape York or west of there from Australia, including perhaps north-west Australia, but failing to invade the area east of the Gulf of Papua.

Until the discovery and description of *Pailsus rossignollii* Hoser 2000, the closed forests near the Gulf of Papua was not considered to be a significant physical barrier to the movement of savannah dwelling Australasian snakes (as was the case for the central range of New Guinea), long known to split taxa (see for example Kluge 1974 in his discussion of *Lialis jicari*). However for some taxa it clearly is, thereby explaining for example the absence of *Pailsus* from suitable habitats in places like Port Moresby.

Noting that other "Australian" reptile taxa with similar habitat requirements to *Pseudonaja* and *Pailsus* have apparently breached the Gulf of Papua and are found on both sides, it may be prudent to investigate these to see if there are significant differences between the specimens in the eastern and western populations as a result of an isolation likely to be many thousands of years.

Finally, both O'Shea 1996 and Williams et. al. 2005 allege that Eastern Brown Snakes in island New Guinea are feral and introduced to the island by humans during the second world war.

These claims are rebutted and patently ridiculous as evidenced by the wide distribution of both New Guinea subspecies, including in areas away from inhabited regions and in numbers not possibly explained through natural breeding in the post World War Two period.

OTHER AUSTRALIAN "*PSEUDONAJA*"

A notable point in terms of *Pseudonaja textilis jackyhoserae* subsp. nov. is it's relative abundance where it occurs. This is in stark contrast to the relative rarity and patchy distribution of *P. textilis* in adjacent parts of northern Australia, including Cape York and the Northern Territory.

The contrast presumably relates in terms of competing species, some of which appear to be lacking in New Guinea.

While Hoser 2001 noted the absence of *Cannia australis* in New Guinea as a major factor relating to the abundance of *Pailsus rossignollii*, another factor in terms of *Pseudonaja textilis jackyhoserae* subsp. nov. is probably the absence of *Pseudonaja nuchalis* (of any of the three Australian "forms" or "species") in New Guinea. Noting that in Australia, *P. nuchalis* is strong in the top-end but *P. textilis* is not, it'd be reasonable to assume that where both species cohabit, they compete directly, with *P. nuchalis* (relevant form/s) apparently having the upper hand in most areas they compete in the dry tropical habitats, including as seen around Merauke and elsewhere in New Guinea, where fortunately for the *P. textilis*, the *P. nuchalis* (all forms) never made it to.

As to why the *P. nuchalis* never made it to New Guinea, one can only guess, although the most logical conclusion would be that the species arrived in northern Australia after see levels had risen (post 11,500 YBP).

An alternative but less likely explanation could be that *P. nuchalis* died out after arriving on the New Guinea side of Torres Strait.

> Questions relating to widely distributed Australasian snakes found only on one side of Torres Strait.

Similar questions and conclusions may be drawn for other Australian taxa, including for example the Black-headed Pythons (*Aspidites melanocephalus*), common to the top end of Australia, but absent from New Guinea. This would lead to the inevitable conclusion that the taxa is recently derived from stock further south, as in where Womas (*A. ramsayi*) presently inhabit, with the less likely alternative being that specimens from southern New Guinea died out after the land-masses were divided by rising seas.

Conversely, the absence of widely distributed (in southern New Guinea) *Leiopython hoserae* from Australia raises similar questions, including in terms of it's origins.

Did these snakes derive from stock from north of New Guinea (where the similar *Leiopython albertisi* occurs)? Did *Leiopython hoserae* arrive in southern New Guinea before sea levels began to rise, sometime after 11,500 years BP (BP = before present)?

Noting that the differences of *L. hoserae* versus *L. albertisi* are significant and based on geological/ distributional evidence and morphology differences that show likely presence of *L. hoserae* in southern New Guinea for millions of years rather than thousands, the question remains, why aren't they in northern Australia?

Besides *Aspidites*, another obvious competitor in northern Australia not in New Guinea is the elapid taxon, *Cannia australis*.

Hence *L. hoserae* or it's precursor may have at one time also inhabited what is now northern Australia.

ETYMOLOGY

Pseudonaja textilis jackyhoserae subsp. nov. is named in honour of my daughter, Jacky Hoser, aged 7 in 2008, who has already made a great contribution to wildlife conservation through her work in educational reptile shows by our company

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Jacky Hoser, in these photos aged seven, demonstrating world's deadliest snakes (Taipans) and others, risk free as venomoids. Photos: Raymond Hoser.

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Snakebusters. In several years of handling the world's five deadliest genera of snakes, she has never had a bite from any, indicating a general lack of skill by so-called "snake handlers" many years her senior, who have made countless trips to hospitals to deal with snakebites and serious life-threatening envenomations.

PSEUDONAJA GUTTATA WHYBROWI SUBSP. NOV.

HOLOTYPE

Specimen number R4646 from the Northern Territory Museum, collected from Anthony's Lagoon, NT, 17°59'S, 135°32'E.

PARATYPES

Specimen number 1502 from the Central Australian Museum, collected from Brunette Downs, NT, 18°39'S, 135°57E, and specimens numbers 3217 and 3218 both from the Central Australian Museum, collected at Brunette Downs/Alroy Downs Boundary, NT, 19°05'S, 136°10'E.

DIAGNOSIS

Pseudonaja guttata is a taxa with a dominantly black buccal cavity.

It is separated from other "*Pseudonaja*" where it occurs by the mid-body scale row count (19 or 21 in *P. guttata*, versus 17 in other relevant taxa)

See Cogger (2000), Skinner (2005) and Gillam (1979) for a more detailed diagnosis of this taxa as compared to similar species in the Northern Territory and nearby Queensland.

Pseudonaja guttata whybrowi subsp. nov. is separated from *P. guttata guttata* (Holotype from Winton, Qld, 22°19'S, 143°03'S) by the following suite of characters.

Mid body scale rows are consistently 19 and this taxa is restricted to the Northern Territory.

There is a gap in the distribution of *P. guttata* between Avon Downs, NT and Lorna Downs Queensland. The NT population is hereby assigned to the taxa *Pseudonaja guttata whybrowi* subsp. nov. while the Queensland population is hereby assigned to *P. guttata guttata.*

The distribution gap is a useful means to separate the two subspecies, but is not the only way to be able to do so.

Queensland *P. guttata* differs from *Pseudonaja guttata whybrowi* subsp. nov in terms of several character states including that almost all specimens have 21 mid body rows (vs 19).

Pseudonaja guttata whybrowi subsp. nov has on average a lower subcaudal count than for Queensland *P. guttata*. Gillam 1979 cites 44-50 (Mean 47, N=10) in what is herein named *Pseudonaja guttata whybrowi* subsp. nov versus 48-59 (mean 54, N=15) from Queensland *P. guttata.*

The taxon *Pseudonaja guttata whybrowi* subsp. nov is little known in the wild, save for a handful of anecdotal reports. Captives have been maintained for years on a dominantly rodent diet and breed with little difficulty. Due to their venomous nature they are not a popular captive, but due to their relatively even temperament (In terms of other "*Pseudonaja*") and often banded adults, they are probably the most sought-after "*Pseudonaja*" in the "pet trade".

ETYMOLOGY

Named in honour of herpetologist Pete Whybrow, who has made a valuable contribution to herpetology in Australia. It is unfortunate that his head is so large that when his wife Judy gave birth to his child (named James) the baby's head was so large that an assisted birth was necessary.

PSEUDONAJA AFFINIS CHARLESPIERSONI SUBSP. NOV.

HOLOTYPE

A male specimen at the "Australian National Wildlife Collection", Canberra, number R1968 collected in August 1970 from 25 miles (40 km) east of Ceduna, SA., Lat 32.18, Long 134.03.

The specimen has 56 subcaudals (all divided), and the middle part of the specimen is also missing, from below the heart region to just above the venter.

DIAGNOSIS

Pseudonaja affinis charlespiersoni subsp. nov. are separated from *P. affinis affinis* (and other WA *P. affinis*) by the following characters. *Pseudonaja affinis charlespiersoni* subsp. nov. typically possess 17 as opposed to 19 mid-body rows. Furthermore the rostral scale is usually large and conspicuous in dorsal view, as opposed to being scarcely visible from above as in WA *P. affinis.*

Pseudonaja affinis charlespiersoni subsp. nov. is restricted to SW South Australia.

P. affinis are separated from similar taxa (*P. textilis* and *P. inframacula*) by the possession of a dark grey throat, contrasting with a paler ventral surface, whereas *P. inframacula* typically have a dark grey belly, while *P. textilis* lack the dark grey throat.

ETYMOLOGY

Named in honour of Charles Pierson, best known as a publisher of numerous high quality educational books. In 1989, he published my book *Australian Reptiles and Frogs*, in 1991, the definitive *Endangered Animals of Australia*. Most notably however he literally put everything he owned on the line and lost it all, when in 1993 he published the ground-breaking *Smuggled:The Underground Trade in Australia's Wildlife.* The book was illegally banned

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by the NSW National Parks and Wildlife Service (NPWS), who a month later were forced to lift the ban as a result of media publicity. This ban and the legal costs involved in overturning it, were what sent Pierson broke and forced him to ultimately sell his property in the Sydney suburb of Mosman.

The book did however became a best seller and as a direct result of that book and the later *Smuggled-2*, published in 1996, private individuals in Australia were for the first time ever, allowed to keep live reptiles as pets and for study, regardless of where they lived. In NSW in particular, prior to the publication of the books, anyone who dared attempt to keep reptiles as pets would be subjected to armed raids, and jail, even for reptiles as common as Bluetongues (Genus *Tiliqua*). The same situation seen in Western Australia was also reversed as a direct result of the *Smuggled* books.

Everyone who in the 21st Century who keeps reptiles as pets in a private capacity, owes Pierson an eternal debt of gratitude for his courage in publishing the book *Smuggled*.

GENUS *OXYURANUS*

Hoser (2002) detailed the then known species and subspecies of "Taipans", including the formal description of the taxon from north-west Australia. Following on from the taxonomy of Covacevich, J., McDowell, S.B., Tanner, C. and Mengden, G.A. (1981), and most authors since then, Hoser (2002), kept the species *microlepidota* in the genus *Oxyuranus*, relying on that diagnosis.

While that taxon is clearly related to other Taipans (other *Oxyuranus*), it is now my considered view that the differences in the taxon *microlepidota* are sufficient to warrant it's placement in another genus. The available name under the ICZN "Rules" for this placement is *Parademansia* Kinghorn 1955.

The decision to remove *microlepidota* from *Oxyuranus* comes from the benefit of having specimens of this and *scutellatus* at our facility for some years and the unique ability to observe all aspects of living venomoid specimens of both snakes at close quarters to an unprecedented degree.

While relying on the diagnosis of Covacevich et. al. for the genus *Oxyuranus* to remain, I hereby add the following differences as itemized below to redefine the genus *Parademansia* Kinghorn 1955.

The list of differences given is also far from exhaustive.

The type species *microlepidota* which also happens to be the only one in the genus, differs from all other known *Oxyuranus* in several important regards. This includes, dentition, with the fangs being considerably smaller in this taxon, as compared with all *scutellatus*.

For the first time ever, I report that the smaller fangs reflect in the feeding behaviour of the snakes, in that *microlepidota* tend to chew on prey when biting including using post fang maxillary teeth and often leaving bite marks showing several breaks in the skin from the teeth, with the number of maxillary teeth being generally absent in the same number in *scutellatus*, whereas *scutellatus* will bite once and hang onto the prey and drag it under some sort of cover, where it waits for it's venom to take effect. Venomoids do not know they have been "devenomized" and act the same way as "normal" snakes.

The "snap release" bite as documented for both taxa by other authors, is in my view a defensive bite, seen in most elapids, including Death Adders (*Acanthophis*), which otherwise also hold on to prey when first biting it.

The snap release grip is not usually the bite employed for feeding, unless perhaps the prey item painfully bites the snake, causing it to release it's grip, or alternatively the prey taste is contrary to what the snake fancied or anticipated.

While both taxa will reverse crawl to a greater degree than other similar sized elapids, this trait is far more pronounced in *scutellatus*. The elongation of the neck is more apparent in *scutellatus* than in *microlepidota* while the degree of seasonal colour change in *microlepidota* is considerably more pronounced.

More importantly, the reduced number of scale rows in *microlepidota* (21), versus 23-25 in *scutellatus* is important as this is a generally conservative character in elapid snakes.

Hence the situation as of 2002 would have then become one of each genus being effectively monotypic with the taxon *Oxyuranus scutellatus* having named subspecies.

In 2007, Doughty, Maryan, Donellan, and Hutchinson formally named a new taxon, "*Oxyuranus temporalis*" based on a Taipan found in the remote central ranges of Western Australia.

While that paper paints this taxon as a new "third species", the diagnosis in terms of physical characters is weak at best and in parts erroneous, in that character states that supposedly separate this taxon from the other two *Oxyuranus* (as defined by Covacevich et. al.1981 and adopted by them) are in fact often shared with the other taxa.

See for example their references to ventral colouration of their new "species".

For reasons unknown, it appears that in their rush to publish the description, the authors failed to look at

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many specimens of the relevant taxa to see if their diagnosis actually worked!

Based on the photos of the holotype, the only known specimen of this "species" (*temporalis*) and the physical characters identified (scale counts, dentition and the like), it is clear that in many respects this new taxon is much closer to *scutellatus* than *microlepidota*. Furthermore, in spite of it's obvious arid zone distribution, this taxon doesn't appear to fit midway between the other two taxa.

Hence there is nothing in terms of the new taxon *temporalis* that negates the merit of my (tentative) placement of *microlepidota* into the genus *Parademansia*.

If one accepts the view of Doughty et. al., in terms of the new Taipan/*Oxyuranus* being a new species, namely *temporalis*, which I tentatively do, then the case for the monotypic genus *Parademansia* is in some ways strengthened, due to the obvious difference between that snake and all other known Taipans, with others having the obvious differences outlined already (as a group).

NEW GUINEA TAIPANS

Intensive investigations into these snakes commenced in the late 1990's as part of a wider investigation into several species and genera of snakes in northern Australia/New Guinea where taxa had been overlooked by other workers. O'Shea 1996, p. 163, bottom left, provided a picture of an "*Oxyuranus scutellatus canni*" that looked quite radically different to the other three specimens on the page from Central Province (near Port Moresby), which would have been typical of the type race for the species.

Mark O'Shea's apparent lack of skill in identifying snakes is well-known and/or differences between known taxa, and seen repeatedly in his book.

Examples include the depiction of two species of python in the same 1996 book under the name *Leiopython albertisi*, with him taking seven years to recognize the reality of the species *Leiopython hoserae* Hoser 2000, after the Hoser 2000 paper was published.

That didn't however stop him publishing stinging criticisms of the 2000 paper, including for example, as (alleged) coauthor in Wüster's 2001 piece that was shopped to various journals before ending up in *Litteratura Serpentium* (see Wüster et. al. 2001). At the time these usual critics of all things "Hoser" were still denying the obvious as in, the existence of *Leiopython hoserae.*

In fact on countless internet posts, O'Shea, Wüster and Williams declared the taxon and the name "nomen nudem" and continued to masquerade the view that this taxon was simply a variant of the better-known *Leiopython albertisi*.

In his book on pythons published in 2007, O'Shea again refused to accept the reality of *Leiopython hoserae*, even though by that stage, it was clear that python researchers worldwide had effectively unanimously adopted the reality of the "Hoser name", as easily verified by a "google" search for the same name.

It wasn't until end 2007 that in *Herptile* (a journal over which he apparently exercises despotic editorial control and censorship, although not nominally in the role of editor) and again in 2008, that O'Shea finally and grudgingly accepted the reality of the taxon, *Leiopython hoserae* Hoser 2000! See O'Shea 2007a, 2007b, and 2008.

His 1996 book depicted the species *Pailsus rossignollii* Hoser 2000, at the time an undescribed taxon, which he erroneously labeled "*Pseudechis australis*", which happens to be a substantially different species that is restricted to continental Australia and immediately offshore islands.

In terms of Death Adders (Genus *Acanthophis*), O'Shea's identification skills are apparently woeful, which is amazing considering they are a common snake in New Guinea and he has put himself up as an expert on new Guinea reptiles in numerous places including his book, on TV "documentaries" and various print publications.

All Death Adders in his book are labeled " *Acanthophis* sp.", including such forms as *A. laevis* described in 1877, and *A. rugosa* described in 1948, both forms of which were formally described many years before I was even born and well before the 1980's when Wells and Wellington 1983 and 1985 delved into the taxonomy of the genus.

And while O'Shea can bitch and moan about Raymond Hoser's taxonomy, the fact is that both *laevis* and *rugosa* are valid species and were properly described by Macleay in 1877 and Loveridge in 1948, so you'd expect O'Shea to have finally got them right half a century later!

Even long after the publication of Hoser 1998 finally settled the taxonomy and nomenclature of the Death Adders of island New Guinea, O'Shea's publications have continued giving no reasonable guidance as to what *Acanthophis* in New Guinea is which, even though Hoser has published accurate keys to the species in New Guinea!

Hence, and notwithstanding the often-stated belief by O'Shea and colleagues, including Wüster and Williams that all New Guinea Taipans should be assigned to the subspecies *canni*, I continued investigating specimens from the west (principally Merauke), and finally formed the view that they are sufficiently differentiated from *canni* to be identified

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and named a new subspecies.

***OXYURANUS SCUTELLATUS ADELYNHOSERAE* SUBSP. NOV.**

HOLOTYPE

A specimen in the British Museum of Natural History from Senggo, Irian Jaya, Lat 5.98 Long 139.36, BMNH 1992.542.

PARATYPE

A specimen from OBO, PNG, Western Province, Lat. 7.35, Long 141.20, in the California Academy of Sciences, CAS 133796, collected by Fred Parker.

DIAGNOSIS

Oxyuranus scutellatus adelynhoserae subsp. nov is readily separated from *O. s. canni* by colouration. Dorsally *Oxyuranus scutellatus adelynhoserae* subsp. nov. is olive or dark brown, whereas *O. s. canni* is grey to black or light blueish grey with a wide orange dorsal stripe with indistinct edges commencing from about the mid-body and running to about the vent region.

This dorsal stripe is sometimes less distinct or even absent in some *O. s. canni,* and while seen sometimes seen in *Oxyuranus scutellatus adelynhoserae* subsp. nov., this is not commonly the case.

Oxyuranus scutellatus adelynhoserae subsp. nov. is separated from Australian *O. scutellatus scutellatus* and the north-west Australian subspecies on the basis of colouration. Australian *O. scutellatus* of both subspecies have a distinctive reddish brown tinge not seen in the New Guinea snakes.

If and when this tinge is absent, the specimens are either aberrantly coloured or within three weeks of a slough.

An olive tinge in the colour is definitive of the subspecies *O. scutellatus adelynhoserae* as no other Australian or New Guinea *O. scutellatus* have this.

This is a diagnostic character for the taxon and is reported here in accordance with article 13(1) of the ICZN code 2000.

Oxyuranus scutellatus canni is herein restricted to the region surrounding Port Moresby, Central Province, PNG and nearby areas. Taipans found from the Fly River drainage (Western Province), and westwards are of the subspecies *Oxyuranus scutellatus adelynhoserae* subsp. nov..

In the lowlands rainforest region bounded by the Purari River (Gulf province) and Bamu river, there are no reliable records for any *Oxyuranus* and this region is thought to be the natural barrier separating *Oxyuranus scutellatus canni* to the east and *Oxyuranus scutellatus adelynhoserae* subsp. nov. to the west.

Populations of the two New Guinea subspecies are believed to be geographically separated with no known gene flow between them. The period of this separation are not known.

Studies have been published in relation to venom properties, DNA and other aspects of Taipans in Australia, New Guinea and both.

However the sample sizes of specimens used have tended to be small and the methods used also inconsistent, the result being it is hard to get any further insight into the relationships of the various subspecies based on published papers to date.

Added to this problem has been the fact that until now, all New Guinea Taipans have been erroneously referred to the subspecies *canni*, when those from places in Irian Jaya in particular should be referred to a different subspecies, now named as *Oxyuranus scutellatus adelynhoserae* subsp. nov.

Specimens of *O. scutellatus adelynhoserae* are believed to be more closely related to Australian *O. scutellatus* than *O. s. canni* based on their underlying similarity in colouration and other factors.

Venom toxicity of all *Oxyuranus scutellatus* is believed to be high, with numerous studies published to date. So far there are no conclusive studies comparing the venoms of regional populations, including those of the two different New Guinea subspecies, or for that matter decent comparisons between the Australian taxa and the New Guinea ones that involve large sample sizes and consistent sampling methods.

Most reports on the behavior of all subspecies of *O. scutellatus* tend to be sensationalist and exaggerate the alleged speed of movement and aggressiveness of these snakes.

In all manner of behavior, they fit within the normal range for other similar-sized elapids and by no stretch of the imagination can a Taipan be defined as aggressive.

In five years of free-handling captive Coastal Taipans (*O. s. scutellatus*) on a daily basis, I have never been bitten. Those snakes have been venomoid.

By contrast, three bites from (venomoid)(devenomized) inland Taipans (*Parademansia microlepidota*) during the same period arose in every instance when the snake was agitated by another snake and the biting snake simply struck at the nearest object that happened to be my arm.

ETYMOLOGY

Named in honour of my daughter, Adelyn (pronounced “Adder-lyn”, like the Death Adder

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Adelyn Hoser, in these photos aged nine, demonstrating world's deadliest snakes (Taipans) and others, risk free as venomoids. Photos: Raymond Hoser.

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snake) Hoser, aged 9 in 2008, who has already made a great contribution to wildlife conservation through her work in educational reptile shows by our company Snakebusters. In several years of handling the world's five deadliest genera of snakes, she has never had a bite from any, indicating a general lack of skill by so-called "snake handlers" many years her senior, who have made countless trips to hospitals to deal with snakebites.

THE NORTH-WEST AUSTRALIAN TAIPANS

This taxon was formally named in Hoser (2002) as "*O. scutellatus barringeri*".

The key definitive diagnostic characters identified were distribution and DNA, the differences in terms of the latter not actually specified.

In a 2004 paper (Wüster et. al. 2004), wrote and without substantiation, the following comment, which as intended has been widely quoted and circulated, including on friendly internet sites:

> "The name *O. s. barringeri*, proposed for the populations from the Kimberley area of Western Australia by Hoser (2002), is a *nomen nudum*, as the description does not provide a diagnosis compliant with Article 13.1 of the International Code of Zoological Nomenclature."

They provided no elaboration or further information.

The claim of "Nomen Nudem" has consistently been used by convicted wildlife smuggler David Williams (co-author in the above referred paper) and partner Wulfgang Wüster for all Hoser named taxa and should be treated with the disdain the comment deserves.

For the record, the relevant article of the code (Ride et. al. 2000), states that to be available, every name must:

> "13.1.1. be accompanied by a description or definition that states in words characters that are purported to differentiate the taxon".

While the original paper speaks for itself and my views are different to those of the authors (Wüster et. al.), there is little if any prospect of them conceding ground or desisting from their intended deliberate confusion on the matter.

The long-term intent of this deliberate confusion is to cause non-use of the original name "*barringeri*" and perhaps ultimately a hearing and opinion at the ICZN, which at best may take years, or worst case, even decades to resolve.

As the ICZN tends to rule on the grounds of stability (their stated guiding principle), rather than their own rules and articles as published in the code, the outcome of a long-running battle either involving or not involving the ICZN is not certain, especially as the stated aim of Wüster, Williams and others is to deliberately create instability and confusion.

To resolve the situation and stabilize the nomenclature of the taxon in accordance with the code as most recently published, I hereby publish a totally new description of the relevant taxon, without reference to the 2002 description in any way, with sufficient information to conform with even the most rigid or convoluted interpretation of Article 13(1) of the rules and other ICZN rules as relevant. This description also amends and updates known information on the taxon, but again is written without any direct reference to or connection with the 2002 paper.

NORTH-WEST TAIPAN *OXYURANUS SCUTELLATUS ANDREWWILSONI* SUBSP. NOV.

Holoytpe: A poorly preserved sample of a sub-adult specimen collected by W. H. Butler on 6 November 1978 lodged at the West Australian Museum (registered number R60666). The snake was collected 6 km North-west of Amax Camp on the Mitchell Plateau, (approx. Lat 14º47' Long 125º55') in the northwest Kimberley region of WA (Butler, 1979). The specimen was about 136 cm long including it's tail of 22 cm.

Dorsally the scales are long, narrow and smooth with very weak keels around the neck. There are 23 mid-body rows, 241 ventrals, single anal and 69 paired subcaudals. The prefrontals are large (nearly as long as the supraoculars and much wider). The frontal is straight-sided and about two and a half times as long as it is wide and slightly narrower than the supraocular. The nasal is entire. The preocular is higher than wide and separated from the nasal and frontal. There are 2+2 temporals on one side and 2+3 on the other side. The lower primary is largest and descends deeply between the last two labials. There are six upper labials and seven lower labials.

DIAGNOSIS

Unlike all other *Oxyuranus scutellatus* (either from eastern Australia or Island New Guinea), this taxon does not have a distinct lightening from the snout.

In common with other *O. scutellatus*, the eye is reddish.

Also the shape of the head is distinctly rounded as compared to all other *Oxyuranus scutellatus* (either from eastern Australia or Island New Guinea), which are herein broadly defined as having coffin-shaped heads.

Combined, these are without doubt the most simple means to separate this taxon from all other *Oxyuranus scutellatus* subspecies.

This is the subspecies of Taipan that occurs in North-west Australia including the top end of the Northern Territory. It is the only known form of Taipan from this

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area. *Oxyuranus scutellatus andrewwilsoni* subsp. nov. is separated from other Taipans *Oxyuranus scutellatus scutellatus and Oxyuranus scutellatus canni* by any, any combination of or all the following characteristics and/or characteristics not listed herein.

Scalation on the neck is more rugose in *O. scutellatus andrewwilsoni* subsp. nov. as opposed to usually either weak or absent in all other *Oxyuranus* (either from eastern Australia or Island New Guinea).

O. scutellatus andrewwilsoni is also separated from all other *Oxyuranus scutellatus* by distribution.

Oxyuranus scutellatus scutellatus is only definitively known from the coastal strip of Queensland and nearby areas. Other *Oxyuranus scutellatus* subspecies are restricted to island New Guinea. No *Oxyuranus scutellatus* are known from the Gulf of Carpentaria (except the east side) and hence the taxon *Oxyuranus scutellatus andrewwilsoni* is geographically isolated from all other *Oxyuranus scutellatus*.

Oxyuranus scutellatus from islands off the NT and WA coast are also referable to the subspecies *andrewwilsoni*.

All subspecies of *Oxyuranus scutellatus* are further separated by DNA analysis.

In 2002, this author knew of only two specimens of *Oxyuranus scutellatus andrewwilsoni*. These were the type specimen and a second specimen from Koolan Island, WA (Storr, Smith and Johnstone 1986). Koolan Island (Lat 16º08' Long 123º45') is about 130 km in a straight line, north-north-west of Derby. The Island has an airstrip so in theory it shouldn't be too hard to mount an expedition to the area to search for further specimens.

Further specimens have emerged and been inspected, including from the Northern Territory.

Taipans (*Oxyuranus scutellatus andrewwilsoni*) are separated from other similar venomous snakes known or thought to occur in north-west Australia by a number of characters including the following:

Oxyuranus has two primary temporals vs only one in *Pseudonaja*. (refer to Storr, Smith and Johnstone 1986)

Oxyuranus has 21-23 mid-body rows vs 17 in *Cannia* and *Pailsus* (refer to Hoser 1998).

In relatively recent geological times, the distribution of all *Oxyuranus* may have declined due to competing species, in particular *Cannia australis* and variants thereof (refer to the arguments presented in Hoser 2001 with reference to similar species as (potentially) being equally applicable to snakes of the genus *Oxyuranus*, thereby explaining the present day disjunct distribution).

Those arguments were plagiarized and bootlegged by Wüster et. al. 2004 without correct citation or attribution of the original source.

ETYMOLOGY

The name is in honour of Andrew McMaster Wilson (usually calling himself Andrew Wilson). He has decades long experience with reptiles and has an enviable record in terms of his educating the public about reptiles with Australia's leading reptile demonstrator's "Snakebusters".

At the time of writing this paper, Andrew was very ill with a form of cancer.

WHY ARE TAIPANS (*OXYURANUS*) SO DEADLY?

For the first time ever this question is answered, at least in part.

This question is perhaps better asked as to why have they evolved particularly deadly venom.

Observations of feeding in these snakes in captivity yields an important difference in terms of their swallowing ability as compared to other elapids of similar size.

Put simply, they are capable of distending their head and neck to allow much larger items to be swallowed, putting them in the ballpark of some pythons in terms of swallowing ability.

This swallowing ability is tested regularly as captives readily take larger food items than other elapids of similar size.

In the wild state, elapids must kill food "instantly" and preferably before the prey item either bites back, or flees too far away. This is why venom must be so deadly in all snakes.

The venom that kills a mouse instantly (within seconds), kills larger mammals like humans in minutes or hours.

With the average adult Taipan (about 1.5-2 meters long) eating rats, which are about 10 times the mass of mice, the diet of other similar sized elapids, it stands to reason that the Taipans need to have venom ten times deadlier in order to kill prey in a similar time frame.

The deadliness is defined here as the multiple between toxicity and actual amount yielded in a bite.

TAIPANS IN CAPTIVITY

While Taipans occupy a unique place in the human mindset, due to their extreme venom toxicity, the reality of Taipans in terms of how they see the world and their captive husbandry is notably unspectacular.

As it happens, the successful captive husbandry for Taipans is effectively no different to that for other large elapids. There are no idiosyncrasies or features that make these snakes particularly hard to keep, other than perhaps the common range of ailments seen in all other large elapids from time to time, be they infectious diseases, parasites or age-

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related complications.

In terms of feeding, this is rarely a problem in that even newly hatched snakes generally feed voluntarily in captivity, which contrasts with some other Australian elapids when first offered rodent prey as young snakes.

In reality, the extreme venom toxicity of this snake has been a negative factor for these snakes in captivity as seen in the example given shortly.

A factor commonly seen in reptile collections with dangerous elapids, especially Taipans has been a general reluctance of keepers to handle the relevant snakes due to the very real worry of dangerous bite.

This is seen in cages not being cleaned as often as necessary, fecal accumulation and the like.

At it's worst, this reluctance to engage in "hands on" with these snakes leads to diseases being undiagnosed until too late in terms of survival of the snake, or as shown below, simple fear to treat treatable ailments than untreated may become fatal.

In contrast to this picture, I have for many years advocated that keepers must countenance the risks of bites if and when keeping elapids, with myself always regarding the snake's welfare as the paramount consideration.

Secondarily, a reasonable amount of common sense can avoid serious bites, without the neede to engage in undue brutality to the snakes in terms of day to day handling.

A classic example of this "neglect through fear" of Taipans can be seen on a Youtube video of a newly acquired New Guinea Taipan, held by North American Al Coritz (calling himself "Viperkeeper") as seen online in early 2008 (posted in 2007).

In his home-made video clip posted at: http://www.youtube.com/watch?v=ujBiDuIoYgM spanning nearly 14 minutes, he repeatedly gloats over the fact that he is keeping a mega deadly snake and how as a result, he is afraid to handle it.

Coritz even points out a parasitic tick on the snake (also seen with long-overdue and unshed skin at 31 seconds into the video) and mentions that due to his fear of the snake he will not remove it.

Of course, ticks (such is the large one depicted on the snake's neck) carry other parasites (e.g. flukes) and diseases and through simple blood borne infectious agents may quite quickly kill a snake (wild or captive).

Put simply, on that basis alone, Coritz should not be allowed to keep Taipans.

(Tubing the snake and injecting with ivermec, all safe and easy, would have killed the tick/s).

But to make things far worse, the same video shows his caging and it shows pretty much everything in terms of how not to keep Taipans. There is effectively no ventilation in the cage. Added to this is a thin clear plastic water bowl that the snake is seen moving about with ease, the result (also shown) is spilt water in the cage (not cleaned up of course), intolerably high humidity, which when combined with the squalid substrate (some now in the water bowl and other littered with visible uncleaned waste material from the snake) forms a culpably filthy bacterial cocktail that will almost certainly guarantee a very rapid demise of the poor hapless Taipan.

Coritz's reluctance to properly clean his Taipan's cage is repeatedly explained by his comments about the speed and deadliness of the snake and when combined with another (2008) video of himself promoting convicted wildlife smuggler David John Williams (see above) at: http://www.youtube.com/watch?v=QzgluS-tIKc, is entirely understandable.

In true American style, Coritz is seen to be morbidly obese and hence it comes as no surprise that he is understandably afraid of his inability to avoid a bite from the Taipan if the tick infested snake chooses to strike.

This real fear is enhanced by the fact that the Taipan and other snakes at his facility are apparently brutalized by the use of bone-breaking tongs and other implements as depicted in his above-mentioned video clip and others he's depicted on "youtube".

The Coritz clips also demonstrate a growing problem of misinformation on reptiles in terms of what is seen on the internet.

Too many novices view what's on the web as "fact" and/or acceptable practices (which they are not), the result being that often misinformation bounces around so much until it becomes widely believed as true.

The end-point of course is a higher mortality in terms of snakes, including dead snakes with bones broken through use of metal tongs.

The correct way to keep Taipans in captivity, free of squalid cages, tong trauma and the like can be found in various publications, most notably, Barnett (1999) and Hoser 2008b, both papers of which include information and data on both keeping and breeding of Taipans.

While at the time of writing this paper in mid 2008, all our Taipans have been venomoid for some years, so we have an obvious advantage in that there is zero risk in terms of cleaning cages, inspections and the like, this has not always been the case, with all relevant snakes having been either acquired as venomous and/or hatched here from our own

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incubated eggs as fully venomous young.

(For the record, for more than three decades, no Hoser elapids were venomoid and in that time snake's welfare was never compromised and also no life threatening bites incurred).

In the case of one of the Inland Taipans, I had to force-feed the (originally hatchling) snake for about a year (fully venomous) before it commenced feeding voluntarily, after which is was venomoided and has remained so for some years since.

Finally there has been considerable deliberate misinformation to the effect that venomoid snakes regenerate venom, most notably on Shane Hunter's site (www.aussiereptilekeeper.com) on which convicted smuggler David Williams has made himself "moderator" or controller.

The fact is that, in none of our fourty odd such (venomoid) snakes has this occurred. This has been confirmed by several means, including inspections by myself and several qualified vet surgeons, post mortems of dead venomoids (2 such cases), including photographic proof, attempted extractions of venom by all available means, milking, biting animals (or myself) and so on.

In terms of myself, all venomoids, including the Taipans have been made to bite me in front of large audiences of witnesses, and we have made several videos of this.

Interestingly the venomoids are reluctant to bite due to the fact that the snakes are used to being painlessly handled and have no need or desire to bite, so the snakes are forced to bite for the videos being made.

If the long-term venomoid Taipans had in fact regenerated venom, then there is no way, I'd be able to line three of them up (Inland and Coastal) to make them bite me in the arm in succession, with each bite being forced and of long pumping duration, and for me to survive without any treatment of any kind!

Likewise for the various "Snakebusters" staff who have also had venomoid bites just to prove the point that the snakes have no venom.

In places without Taipan anti-venom the use of venomoids makes eminent sense, both for the snake's welfare (see above) and that of the keeper/s.

This is especially the case if and when a fatal bite may occur, the end result being that government/s may use the event as an excuse to outlaw or further restrict the rights of non-government employed reptile keepers.

PANACEDECHIS PAPUANUS (PETERS AND DORIA 1898)

The genus name "*Panacedechis*" is adopted for these snakes based on the results of Shea, Shine and Covacevich (1993), in tandem with the papers of Wells and Wellington 1983 and 1985, which make this name the appropriate available name for this taxon at genus level.

This is the same as seen in Hoser 2001.

Most texts call this taxon, "*Pseudechis papuanus*" as originally named, the common name being the "Papuan Black Snake".

It is an archaic lineage with apparently greater affinities to the Collett's and Blue-bellied Black Snakes than the Red-bellied Black or Mulga/King Brown Snakes. The latter two taxa never crossed Torres Strait indicating a recent evolutionary history, especially when reconciled with the generally continuous distributions of the species across their entire known ranges in Australia.

For many years it has been known that there are two apparently disjunct populations of the taxon *P. papuanus* in island New Guinea. The eastern population, centered on central province of PNG, through to Milne Bay has apparently dropped significantly in abundance following the introduction of Cane Toads (*Rhinella marina*)(known widely as "*Bufo marinus*").

While apparently absent from the Kikori basin, the species is found in a separate western population, that is found throughout most of Western Province and nearby parts of Irian Jaya.

Consistent differences between adult specimens from both populations warrants each being classed as distinct from one another, especially as there is no known gene flow between the populations. Hence the western population is formally described and named below.

The diagnosis for *Panacedechis papuanus* is given in the original description of the taxon, and expanded on in later texts including those cited at the foot of this paper.

These are relied upon here.

PANACEDECHIS PAPUANUS TREVORHAWKESWOODI SUBSP. NOV.

HOLOTYPE

A specimen from the California Academy of Science, specimen number: CAS 139559, from Boboa Island, Lake Murray, Western District, New Guinea, Lat. 7.05, Long 141.35.

DIAGNOSIS

Panacedechis papuanus is a thick-set snake, superficially similar in most respects to the Mulga

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Snake, *Cannia australis*, but is separated easily by it's darker ground colour and different distribution and mutually exclusive distribution. One is found in continental Australia (and adjacent islands), while the other is restricted to Island New Guinea (and adjacent islands), that being *P. papuanus.*

Panacedechis papuanus is separated from Taipans, genus *Oxyuranus* and Brown Snakes (genus *Pseudonaja*) by their more thick-set build and some single (anterior) subcaudals, versus all divided in the other genera.

Pailsus is separated from *Cannia* in New Guinea by their having all or most subcaudals single, versus many posterior subcaudals divided in *P. papuanus*.

There are no other snakes likely to be confused with adults of this taxon.

Panacedechis papuanus generally has 48-65 subcaudals with the anterior ones single and the rear ones divided, which is a character state not shared with any other large elapids in New Guinea that are likely to cause confusion in terms of identification.

Panacedechis papuanus trevorhawkeswoodi subsp. nov. is separated from *Panacedechis papuanus papuanus* by several characters, the most obvious being that adults tend to be nearly pitch black dorsally, whereas specimens of *P. papuanus papuanus* from further east tend to be somewhat lighter in colour, although still a darkish colour.

In *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. there is a slight dark etching around the dorsal and ventral labial scales to a more pronounced degree than is seen in *P. papuanus papuanus*.

Lightening of the snout region to become creamish white is less pronounced in *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. than for *P. papuanus papuanus*, again a useful means of separating the taxa.

The two taxa are of course separated by distribution as noted above, namely that *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. is found west of the Kikori Basin, while *P. papuanus papuanus* is found east of the Kikori Basin.

Included in the distribution of *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. is Sabai Island in Torres Strait, which while being physically near the New Guinea mainland is in fact in Australian government territory.

The two subspecies of *Cannia papuanus* would of course have genetic differences, but these have yet to be determined in detail.

While *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. is known to be oviparous, little is known about it's biology, save for the fact that in most regards it is believed to be a "typical large elapid".

Behaviourally in terms of how these snakes act when caught, handled and held in captivity, *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. is in line with others in the genera *Cannia*, *Panacedechis* and *Pseudechis*.

CONSERVATION

Panacedechis papuanus trevorhawkeswoodi subsp. nov. is common where it occurs and introduced Toads (*Rhinella marina*, formerly known as *Bufo marinus*) remain absent.

However it is reasonable to expect that eventually the entire range of *Panacedechis papuanus trevorhawkeswoodi* subsp. nov. will be invaded by the introduced Toads and the snake will decline in number, perhaps to the point of local or general extinction, as has been seen for *Panacedechis papuanus papuanus* in the most inhabited parts of New Guinea.

Therefore it is appropriate for specimens of *Panacedechis papuanus* of both subspecies to be retained in captivity and bred in sufficient numbers as insurance in the event of extinctions in the wild.

Due to a general lack of resources in New Guinea, the bulk of the captive husbandry should be outside of that country, perhaps in the USA, Europe or Australia.

A general impediment to keeping "exotic" and dangerously venomous taxon has traditionally been the unavailability of appropriate anti-venom, either in real terms or effectively, due to the high purchase cost and short shelf life.

With the development of new means to safely and easily devenomize these snakes (see Hoser 2004 for the basic method and Hoser 2008 for the long-term results and benefits), the safe keeping and breeding of numbers of these snakes without safety risks or the need for the holding of anti-venom stocks is now possible.

Of all snake species in New Guinea, it is fair to assume that *Panacedechis papuanus or perhaps Pailsus rossignollii,* are most at risk, as seen by the sharp declines in cogeners in parts of Australia where toads have been introduced.

The only potential upside to report in terms of regions invaded by Toads is that some years later (ranging from several years to several decades) a "bounce back" is observed, where numbers of reduced species increase as the survivors adapt to cope with the toads.

The best seen example to date has been a general increase in Red-bellied Black Snakes (*Pseudechis porphyriacus*) in Queensland in Cane Toad (*Rhinella*

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marina) infested regions of the coast.

ETYMOLOGY

Named after Dr Trevor J. Hawkeswood, a respected biologist and author of scientific papers, books and other publications on Australian, New Guinean and other animals and plants, having spent decades researching and publishing his findings, including in the journal *Calodema*.

In spite of repeated unlawful threats from David Williams and his criminal associate Shane Hunter in recent years, Hawkeswood has continued his vitally important work.

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VALE LES WILLIAMS

In early 2009, the highly respected snake handler from Ballan, Victoria died.

He was only about 50 years old at the time.

He left behind his wife as well as children from a previous marriage.

In recent years he'd taken bites from a large Mulga Snake (*Cannia australis*) and a five foot (1.5 metre) Tiger Snake (*Notechis scutatus*). For the Mulga Snake he got anti-venom. Miraculously, for the Tiger Snake bite he "toughed it out".

You often hear stories about so-called snake handlers being "better than the rest" and "toughing out bites" that would kill other mere mortals, but it's actually rare to hear a verifiable story like the one above.

In spite of these two bites, and other lesser bites experienced by Les, his snakebite record was not anywhere near as "bad" as that for many other snake handlers.

Les was the first to admit that if you cop a bite from a snake it's only the handler who's to blame.

The reptile world is not a big place, meaning that anyone in the game for more than a few years knows, or knows of everyone else. At least that's the case for those people worth knowing.

I'd met Les at various times and places over the previous 30 years, but couldn't say I actually knew him, although I certainly knew of him.

My first recall of actually getting to know him was late in 2004 when I was demonstrating reptiles at the Ballarat Agricultural Show.

As a close friend of another herpetological legend, Roy Pails, Les came along to see me at the Ballarat event.

He spent most of the next three days there helping out, as both him and Roy ostensibly handed out cards and flyers for Roy's new reptile shop and business, "Pails for Scales".

In fact, most of the time they passed snakes and other reptiles to the public to handle as they came for a view of our exhibit.

At the same time the men educated the lay people about snakes.

Les was one who supported the trialling of the

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Collett's Snakes (*Panacedechis colletti*) to be handed to the public.

Under normal situations, no one would pass the world's twentieth most deadly snake to lay people to "free handle", that is without sticks, tongs, or the brutality of "heading" or "tailing".

However in a world first, these snakes had been surgically devenomized (made "venomoid"), using the method documented by myself in a seminal 2004 paper.

The snakes were an instant hit and Snakebusters graced the front cover of the *Ballarat Courier* the next day and was also featured on the other days of the show in the same paper, fitting for what had in our first year at the venue become easily the main attraction there.

The name "Collett's" snake reflects the scientific name of the snake, but being meaningless to the lay public, it soon became evident that we needed a name with "meaning" for the snakes as in being descriptive and hence the name "Jaffa Snake" was born.

In the following four years, about a million people free handled these two male "Jaffas" and as to be expected there was never a single bite incident, hospitalization or the like.

This is mentioned because rival demonstrators like the McCarthy's calling themselves "Snakehandler", Michael Alexander, calling himself "Black Snake Production" and others ran around feeding misinformation to people that the Jaffas had regenerated venom and were dangerous.

These lies even continued after videos were me of me forcing the said snakes to bite me with no ill effect!

A few years later the McCarthy's spun the same lie to Gerald Ballinger of the Ballarat Show, claiming that the "Jaffas" had killed people at similar events, leading to him in fear canceling Snakebusters for the event. This was even though we'd been in his words, "easily the best reptile demonstration ever seen at Ballarat".

Since then the Ballarat Show has had the McCarthy's "no hands on" "Snakehandler" at the event.

Ballarat Show's loss was our gain as we immediately grabbed other bookings, that turned out to be more lucrative anyway and closer to home, as would be expected for what in Melbourne is the busiest time of the year for major events bookings.

It was in those first three days at Ballarat in 2004 that I actually got to know Les Williams. He wasn't just an excellent reptile handler, although before going further I should explain what this means.

Many people have reptiles. Many people handle reptiles. Many people have years of experience with reptiles. But very, very few actually have such an affinity with the animals that they can handle them effortlessly without ever upsetting or raising the ire of the reptiles or causing them to want to flee or bite.

It soon became apparent that that Les was one of this rare breed.

If it wasn't for the fact that he lived about 90 minutes drive from my house (without traffic), I'd have employed him immediately!

You see there was the other thing that made Les a memorable person. He also had the same affinity with people.

In spite of his age (late 40's), he related with everyone and in terms of handling reptiles and children and everyone else in between, he was literally "a natural".

At Ballarat, myself, Roy, Walter Collins and Roy's other friends were generally run down and "buggered", so to a large extent, Les became the man running the show.

Normally when handing responsibility over to people at events, I have to explain most of the protocols and the like to them.

This I do in a supervisor role, usually standing nearby and as things arise and I see potential problems emerging.

For Les, there was generally no explanations required. As I said, he was "a natural".

Another aspect of Les was his 'no Bullshit" approach to reptiles and his low tolerance of lies and dishonesty.

When he saw posts on internet forums attacking the Hoser venomoids, with the associated false claims made by vested interests and those opposed to the truth, Les would correct them.

On forums controlled by convicted wildlife smuggler and truth hater, David Williams that alleged the venomoid snakes suffered from cruelty, Les was quick to point out the reverse was true.

As a result he was quickly banned from the forums.

In terms of attitudes to people Les was the perfect gentleman. He always offered help and favors, but never wanted anything in return.

In terms of his love for reptiles, that was always his over-riding passion.

For those new to the hobby, Les was an absolute goldmine. He'd spend endless hours with newbies teaching them the ropes of keeping, handling and so on. Few if any other experts of his caliber would spend such time with so-called "nobodies" in order to train the next generation of reptile handlers and

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Les Williams and (some of) his babies (in this case 8 out of 8 eggs hatched from Blue-bellied Black Snakes (*Panacedechis guttatus*)), all females, hatched in early 2008, after he'd been diagnosed and operated on for bowel cancer. Photos: Raymond Hoser.

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conservationists.

In terms of conservation, Les's attitude was also one of no-nonsense and getting your hands dirty if need be.

In spite of his age and declining health, he wouldn't hesitate to crawl under a house on a hot day to rescue an Eastern Brown Snake from a shovel wildling monster standing nearby.

He routinely locked horns with local and Melbourne-based Department of Sustainability (DSE) bureaucrats for their time wasting and anti-conservation actions.

Les was vocal in attacking the DSE in 2008 for wasting a vast amount of taxpayer's money, spending a week at VCAT arguing the lies of David Williams and Shane Hunter that the venomoids had regenerated venom and were a great public risk, when they obviously hadn't.

Les offered to be videotaped taking bites from the lot to prove the lies, but I knocked him back because at the time we knew he was going to die soon and I could see the snakes getting wrongly blamed.

As it happens, the offer was a waste of time, because after I made countless such videos, Williams and the other truth haters stalked the internet harassing ISP's like "youtube" to remove the videos, so that their own lies about venom regeneration could continue uncontradicted.

In terms of DSE, they in turn were beholden to the Snakebusters business competitors, namely the McCarthy's, Alexander and Zoo's Victoria, who all sought to restrict the use of the Snakebusters venomoids, because in their own words they gave Snakebusters "an unfair competitive advantage".

In other words it came down to dollars and cents and the others wanted the income that Snakebusters had.

The VCAT hearing was a shambles with the presiding judge, Anne Coghlan obviously corrupt and biased. She stated early in the hearing that she would be ruling against venomoids and that was before the evidence had been given.

That of course is illegal on her part, but she refused to disqualify herself when the application was made.

Her written judgement after the case was fraudulent and misrepresented the evidence of key witnesses. She also ignored the video evidence (not even mentioned in her judgment) of the repeated forced bites from world's deadliest (venomoid) snakes, showing no venom regeneration.

Les was not alone when he remarked that the money DSE had spent on lawyers for the whole VCAT debacle could have instead been used to save every endangered animal in Victoria!

When Les first announced he had been diagnosed with bowel cancer in late 2007, it was hardly an announcement.

Les never let other people suffer his problems. Put another way, unlike some better known reptile handlers like say Steve Irwin, you could never describe Les as a "drama queen".

In fact, I only found out he had cancer by accident.

I was arranging to see him on a given day coinciding with a demonstration near him, and he remarked that he couldn't see me as he was going to hospital that week.

When I asked "why?" he said "Oh, I have to get a bowel cancer taken out", or words to that effect.

Having recently lost a few friends to cancer, I immediately knew the ramifications of the diagnosis and that in the absence of contrary information, his prognosis was not good.

Les played it down.

As planned he went and had the cancer removed.

After the operation, I asked him about it and to see the scar on his abdomen, which he obligingly showed me and I photographed for posterity.

As often happens with cancers, Les's came back in another manifestation and invaded other body parts in mid 2008, with the later medical prognosis that his condition was terminal and that he didn't have long to live.

Through 2008, his health declined, although Les would never seek sympathy.

In person and on the phone, he was always as open and friendly as ever and never referred to his own suffering.

If asked, he'd play it down.

Throughout 2008, Les continued to play an active role as the best-known snake catcher in Melbourne's western region and also Ballarat.

Cancer wasn't going to stop him until he literally died.

He kept his collection of elapid snakes and other reptiles to within days of his death and no matter how ill he got, he always managed to get the cages clean and when at his dying stages arranged for helpers to do the same.

In late 2008, I did a "Snake handling course" in order to try to train others to be like Les.

Les turned up with a student from Ballarat and as always, everything that came from Les's mouth was words of wisdom.

He wasn't solemn however and his sense of humor matched the best of people.

Around November 2008, Les's health took a severe

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turn for the worst and the palliative care ward of the Bacchus Marsh hospital became his second home.

In early January, Les took a final turn and was rushed to the hospital.

I recall one of his closest friends, Scott Grant of Colac calling me on Friday 9 January saying that Les was on his way out and that if I wanted to see him, I should get to the hospital in a hurry. He'd been in hospital since the Tuesday.

As with most things, the timing of the call was terrible, in this case with me being snowed under with reptile demonstrations.

On Les's request and that of hospital staff, Les got to spend time handling a snake he'd recently bred. That was on Sunday 11 January.

Les's wife, a magnificent woman, noted that it was the only time that Les had smiled and been happy for the entire last week in hospital.

Yes, by that stage, the pain of the cancer was literally killing him.

As Les's wife remarked, the Les I saw on that day was not the Les I'd known.

He had lost weight all over, except in the abdomen, which was where the cancerous material had grown out of control.

He was yellow with jaundice from the toxins in his body and he could barely speak and had the shakes.

All I could see was pain and a sense of resignation, that Les knew his time on earth was over.

As much as everyone loved Les, it was a relief to see that his pain and suffering ended the following Thursday.

I had named a subspecies of snake after Les in a paper originally scheduled to by published in *Crocodilian* in mid 2008.

However, pressure was applied on the editors of that journal by truth-haters Mark O'Shea and David Williams, who had taken it upon themselves to stalk journal editors worldwide with an obsessive view to stopping the publication of any Hoser material.

In the case of this paper, the end result was that the paper was "held over".

O'Shea even provided a sizeable "junk" article to fill the huge gap from the unplanned omission of the paper.

However with the publication of the end 2008 issue of *Crocodilian* then being delayed to mid 2009, due to unconnected circumstances (the editor resigned due to increased work commitments at his new pet shop, and no other editor had been appointed), it was decided to amicably withdraw the paper from *Crocodilian* and submit it to *Australasian Journal of Herpetology*. Unfortunately Les Williams died in January 2009, before he could see the publication of this paper and the recognition for his life-long work with reptiles and their conservation.

Les won't just be remembered for his expertise with reptiles and his lifelong work "hands on" with reptile conservation at various levels. He will also be remembered as an example of what makes people good. The way Les treated other people should be seen as perhaps his most enduring example and what others from all walks of life should aspire to follow.

RAYMOND HOSER, SNAKEBUSTERS, AUSTRALIA.

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