

# Yes there are two species of Copperhead in Victoria! The first ever recorded case of sympatry between Lowland and Highland Copperheads (Genus *Austrelaps* Worrell, 1963).

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## ABSTRACT

Hoser (2009), speculated that while there was a widespread belief that there were two species of Copperhead in Victoria, namely *Austrelaps superbis* (Günther, 1858) (type for the genus), better known as the “Lowland Copperhead” and *A. ramsayi* (Krefft, 1864), better known as the “Highland Copperhead”, there was a possibility that the two forms may be conspecific.

This speculation was based on the absence of fieldwork where the ranges of either taxon abutted (as at that time this was not even known) and the absence of any obvious biogeographical barrier for the two species to remain separate.

Furthermore, the sole diagnostic feature separating the two species (labial markings in the form of presence of white triangles in *A. ramsayi* and absence of them in *A. superbis*), is somewhat fluid in *A. superbis*, with specimens of obvious *A. superbis* from some upland localities such as the Otway Ranges, in south west Victoria approaching *A. ramsayi* in their form.

However Hoser (2009) maintained an open and undecided position on the validity of both taxa making this view clear in that paper.

Notwithstanding the comments of Hoser (2009), the view that both alleged species may be one and the same gained credence among other herpetologists, in part as such a view would tend to refute the notion that New England, NSW specimens were not a different species, (*A. paulinus*) as named by Richard Wells and Ross Wellington in 1985.

This is in view of the fact that Wells and Wellington were strongly disliked by a number of other vocal herpetologists and so many irrationally jumped at any reason not to use a name for a putative taxon they had named. However no hard evidence was produced to confirm such a view as correct.

Misreading the detail of Hoser (2009), both the NSW and Victorian State wildlife departments were as of 2017 treating all Copperheads in Australia as being of a single species.

Refuting this position and confirming that *A. superbis* and *A. ramsayi* are in fact two different species by any reasonable definition is the new evidence presented in this paper.

This is the observed sympatry between both *A. superbis* and *A. ramsayi* on the east side of Warburton in Victoria, some 72 km east of the Melbourne CBD.

**Keywords:** Taxonomy; nomenclature; Australia; Victoria; Snake; Warburton; elapidae; Copperhead; *Austrelaps*; *superbis*; *ramsayi*; *paulinus*; *labialis*; Wells and Wellington; sympatry; two species.

## INTRODUCTION

Hoser (2009a), speculated that while there was a widespread belief that there were two species of Copperhead in Victoria, namely *Austrelaps superbis* (Günther, 1858) (type for the genus), better known as the “Lowland Copperhead” and *A. ramsayi* (Krefft, 1864) better known as the “Highland Copperhead”, there was a possibility that the two forms may be conspecific.

This speculation was based on the absence of fieldwork where

the ranges of either taxon abutted (as at that time this was not even known) and the absence of any obvious biogeographical barrier for the two species to remain separate.

Hoser (2009a) speculated that perhaps the variation seen in specimens from different locations were merely local variation and nothing more and that variation observed to date was simply clinal and not representative of two different species.

Furthermore, the sole diagnostic feature separating the two

species (labial markings in the form of presence of white triangles in *A. ramsayi* and absence of them in *A. superbus*), is somewhat fluid in *A. superbus*, with specimens of obvious *A. superbus* from some upland localities such as the Otway Ranges, in south west Victoria approaching *A. ramsayi* in their form.

However Hoser (2009a) maintained an open and undecided position on the validity of both taxa making this view clear in that paper.

It had been hoped that other herpetologists would seize the opportunity to do fieldwork in the region where the known ranges of each taxon appeared to join to see if there was a well-defined biogeographical break between the two putative taxa, whether there was merely clinal variation as seen in (relatively) closely related Tiger Snakes *Notechis scutatus* (Peters, 1861) across the same geographical range, or perhaps if the two species occurred in a single location sympatrically, giving a definitive answer as to the specific status of each.

Until now, no one has been able to definitively answer the important question as to whether or not the two putative species are in fact one or two.

Molecular data has been obtained for both *Austrelaps superbus* and the putative species *A. labialis* (Jan, 1859) from South Australia (Pyron *et al.* 2013) and this showed both to be closely related, but separate species level taxa. They also happen to have a well defined allopatric distribution.

See Hoser 1989 for details of distribution of all of *Austrelaps superbus*, *A. ramsayi* and *A. labialis* and Wells and Wellington (1985) for details of *A. paulinus* as described and named by them at the time.

Notwithstanding the qualifying comments of Hoser (2009a), the view that both alleged putative species (*A. superbus* and *A. ramsayi* as presently understood) may be one and the same taxon gained credence among other herpetologists, in part as such a view would tend to refute the notion that New England, NSW specimens were not a different species, (*A. paulinus*) as named by Richard Wells and Ross Wellington in 1985.

This is in view of the fact that Wells and Wellington were strongly disliked by a number of other vocal herpetologists and so many of them irrationally jumped at any reason not to use a name for a putative taxon the pair had named (see also Hoser 2015a-f). However no hard evidence was produced to confirm such a view as correct.

Both the NSW and Victorian State wildlife departments were as of 2017 treating all Copperheads in Australia as being of a single species, this being a direct result of a misinterpretation of Hoser (2009a).

Refuting this position and confirming that *A. superbus* and *A. ramsayi* are in fact two different species by any reasonable definition is the new evidence presented in this paper.

This is the observed sympatry between both *A. superbus* and *A. ramsayi* on the east side of Warburton in Victoria, some 72 km east of the Melbourne CBD, the detail of which is presented below.

Nothing in this paper can confirm or refute the notion that *A. paulinus* is a species separate from *A. ramsayi*, although there are obvious (albeit minor) morphological differences between the two putative taxa.

As the distributions for each are clearly allopatric, being split by the Hunter Valley intrusion, consisting of wholly unsuitable habitat, climate and competing species, only molecular analysis is likely to reliably confirm or refute the proposition that *A. paulinus* is a valid taxon.

#### MATERIALS AND METHODS

I own the business Snakebusters, and as part of this education business, I run the only 24/7 snake catcher service in Melbourne, Victoria, Australia, servicing all areas within a 50 km ring around the city and nearby suburbs of Melbourne. Beyond this zone, I occasionally catch and relocate snakes, when no other nearby government-licensed wildlife controllers are available.

It is not necessary for me to outline the generally unfounded fear many people have of snakes and the size of the demand for people like myself to attend people's homes at all hours to remove basically innocuous snakes.

While the most common snakes in Melbourne and environs are all dangerously venomous, these being Lowlands Copperheads *Austrelaps superbus*, Brown Snakes *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854) and Tiger Snakes *Notechis scutatus* (Peters, 1861), the harsh reality is that for any vaguely sensible person, it is almost impossible to get bitten by them. In common with most other reptiles, they run from people at every opportunity and rarely bite even when handled. As a rule, the only thing likely to provoke a bite is the inflicting of extreme pain to the reptile (see Hoser 2009b).

Notwithstanding this reality, many people are brainwashed by trash TV shows like "Crocodile Hunter" and "Deadly Sixty" where pretty much everything that walks or crawls is a one dimensional people killing machine! As a result, snake controllers like myself regularly get calls to remove snakes from all over Melbourne and nearby areas.

This is the basis on which I was able to find both *A. superbus* and *A. ramsayi* at the same location.

#### RESULTS

Warburton is a small township, elevation 159 metres situated at the Upper Yarra River Valley about 72 km east of Melbourne. While the elevation of Warburton and the Yarra Valley running west of there is low, the surrounding countryside is mainly forested and mountainous. To the west of Warburton is Healesville to the north-west and the Dandenong Ranges to the South-west. While much of these areas are of significantly higher elevation than the township of Warburton (e.g. Kinglake 550 m, or Mount Dandenong 633 metres), both places are regularly serviced by myself and the only copperheads removed from both places (including nearby townships) have been Lowlands Copperheads (*A. superbus*).

In fact as a licensed snake catcher, all Copperheads caught by myself anywhere within a 70 km radius of Melbourne have been *A. superbus*. This includes a total of many hundreds of Copperheads taken from all sides of Melbourne.

This has included in the township of Warburton and suburbs west of there, such as Millgrove, Wesburn, and Yarra Junction where Copperheads are common. Over 2 decades to 2017, dozens of Copperheads have been retrieved from Warburton township and townships immediately west and all have been unquestionably very typical *A. superbus*.

On 30 December 2013 I received a call to catch a snake at the home of Brett Flemming at 40 Giffords Road, Warburton, being about 1.5 km east of the Warburton township and of slightly higher elevation to the main township, but still well under 200 metres.

The location is of cleared areas for housing on acreage lots with forests on hills rising at the rear of each of the properties. A gravid female Tiger Snake was retrieved from under a stone step next to the family home. I undertook an inspection of the north end of the property where there were several sheets of tin on the grass next to a small shed.

(How can a snake catcher refuse to lift well positioned sheets of tin that have the word "snake" written all over them?).

At the time the weather was cool and sunny and it was late in the day (6 PM), making the said sheets of tin prime snake real estate.

An adult female Highlands Copperhead (*A. ramsayi*) was found under a sheet of corrugated iron and an adult female Lowlands Copperhead was found under an immediately adjacent sheet of tin.

Each was of the typical form for each putative species and there was no mistaking which was which.

This location appears to be the boundary where the two species ranges abuts and there is no evidence whatsoever of inbreeding between them. They are clearly sympatric.

Since 2013, I have further investigated the Warburton area and

found that in areas east of Gilfords Road Highlands Copperheads (*A. ramsayi*) prevail (including at Reefton and McMahon's Creek), while all areas west of the Warburton township (where there are far more homes), have only Lowlands Copperheads (*A. superbus*). Photos of a Highlands Copperhead and a Lowlands Copperhead, both from Warburton in Victoria, taken by myself are shown on page 2 of this issue of this journal.

While Hoser (2009) mentioned *A. superbus* with labial markings approaching those of *A. ramsayi*, this is definitely not the case around Warburton or anywhere nearby, indicating a character displacement effect between the two species where their ranges either abut or are close.

What has not been established is the extent of the area where both species appear to co-exist.

While it is likely that areas of sympatry between the two relevant copperhead species are only limited, both species are of similar form and habit and there is no obvious factor that appears to dictate why one occurs in one area and another elsewhere, other than the historical ranges for each.

There is also no indication as to whether one or other is expanding its range at the expense of the other.

It should also be noted that while Highland Copperheads (*A. ramsayi*) are usually found at higher elevations to *A. superbus*, this is by no means always the case and altitude alone cannot explain the extant distributions of each species.

#### ACKNOWLEDGEMENTS

While I would like to thank the Victorian government wildlife department and the Victorian police force and roads departments (Vicroads) for giving me licenses to drive to people's homes, catch snakes and save both people and wildlife from potential risks, I cannot do this. For most of the past 30 years to end 2017, corrupt police, roads officials and wildlife officers have spent what often appears to be every waking hour plotting and executing ways to deprive me of my relevant licenses and to put people's lives at risk.

In fact as of 2018, I only retain the right to both drive a car and catch snakes as a result of over 1 Million dollars in cash and kind spent by myself defending this right in the law courts (see Court of Appeal 2014 and Victorian Civil and Administrative Tribunal (VCAT). 2015 for details).

The main motivation for government officers to curtail our lawful business is commercial, in that their own dysfunctional businesses (e.g. "Zoos Victoria") or their staff running snake control businesses on the side, would prefer to have the income Snakebusters derive from their educational wildlife shows, snake control work and the like and because they cannot match our higher standards, they instead use unlawful means to continually try to shut us down (Court of Appeal 2014, Victorian Civil and Administrative Tribunal (VCAT). 2015).

The Warburton Highway, being the only main road to the town from Melbourne is a particularly hazardous stretch of road, because police regularly exploit it to catch "speeding motorists" and issue fines to them.

These "speeding motorists" are people driving appropriately for the road conditions but literally entrapped by overly low limits and variable speed limit signs that change over a short distance and are regularly changed without notice.

In February 2018, I was booked by Victoria Police Highway Patrol for doing 82 kmh in a 60 zone on the way to Warburton to catch and relocate a lowlands Copperhead. The fine was about \$300.

I should note however that the speed limit on this open four-lane dual carriageway road had been dropped from 80 to 60 two weeks prior and there was no signage indicating such a change on any road I had driven on. I had entered the relevant road at a roundabout and the reduced speed sign had been placed 2 km further back down the road, meaning I had not seen it, because I

had entered the road after where the new sign was by turning into the road from a side road into the roundabout. The location was Swansea Road, Lilydale.

In other words, for doing a public service and saving the life of a snake and possibly a member of the public as well I was improperly fined \$300 for driving 82 kmh on a road that in any reasonable circumstance should have had a 100 kph speed limit.

Interestingly, a few km further up the road, where the road becomes a windy, one lane each way road through suburbs, the posted speed limit is in fact 100 kmh!

#### REFERENCES CITED

- Court of Appeal Victoria 2014. *Hoser v Department of Sustainability and Environment* [2014] VSCA 206 (5 September 2014).
- Hoser, R. T. 1989. *Australian Reptiles and Frogs*. Pierson and Co., Sydney, NSW, Australia: 240 pp.
- Hoser, R. T. 2009. One or two mutations doesn't make a new species ... The taxonomy of Copperheads (*Austrelaps*) (Serpentes:Elapidae). *Australasian Journal of Herpetology* 1:1-28.
- Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.
- Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.
- Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-52.
- Hoser, R. T. 2015d. Comments on Spracklandus Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). (unedited version) *Australasian Journal of Herpetology* 27:37-42.
- Hoser, R. T. 2015e. PRINO (Peer reviewed in name only) journals: When quality control in scientific publication fails. *Australasian Journal of Herpetology* 26:3-64.
- Hoser, R. T. 2015f. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.
- Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.
- Ride, W. D. L. (ed.) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK.
- Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015, judgment and transcript).
- Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology*, Supplementary Series 1:1-61.

#### CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within, but does now try to avoid making trips to Warburton as it is costing more money in dodgy police traffic fines than money earned catching snakes.