

World first: Cross genus combat in male elapid snakes!

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ABSTRACT

For the first time ever, cross genus combat in male elapid snakes is documented.

On 4 November 2022, I, Snakeman, Raymond Hoser witnessed and filmed a male Red-bellied Black Snake *Pseudechis porphyriacus* (Shaw, 1794) and a male Eastern Brown Snake *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854) engaged in male combat as usually seen between males of the same species when fighting for a mate.

A detailed account of the event is given.

A video of the combat has been posted at:

https://youtu.be/c7ad_y9H3lc

Keywords: Snakes; elapidae; *Pseudonaja*; *textilis*; *Pseudechis*; *porphyriacus*; Brown Snake; Eastern; Red-bellied black snake; male combat; cross genus; combat; venomoid snakes; devenomized snakes.

INTRODUCTION

Male combat in Australian elapid snakes is well known (Hoser 1989) and has been documented in Red-bellied Black Snakes *Pseudechis porphyriacus* (Shaw, 1794) (Worrell 1963a) and Eastern Brown Snakes *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854) (Hoser 1989).

In the 1990's I filmed a male Blue-bellied Black Snake *Panacedechis guttatus* (De Vis, 1905) in combat with a male Collett's Snake *Panacedechis colletti* (Boulenger, 1902). At the time the video was quite a sensation as it was the first ever documented case of different species engaging in male combat.

These closely related species have even been hybridised in captivity, with a photo of one such specimen published in *Australasian Journal of Herpetology*. Details of the relevant breedings are in Hoser (2007).

Hoser (2007) also noted that for those two species "Tests on the mitochondrial DNA (cytochrome B) of the two taxa, indicate a recent separation of the taxa (3% separation)."

That gives a divergence between the two species as just 1.5 MYA.

On 4 November 2022, I had the good fortune to observe an unprovoked male combat between two willing male snakes of different genera, being

an adult male Red-bellied Black Snake *Pseudechis porphyriacus* (Shaw, 1794) and an adult male Eastern Brown Snake *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854).

Their divergence is measured in the tens of millions of years.

This means they are not even closely related!

The purpose of this paper is to document this event and add it to the permanent scientific record.

MATERIALS AND METHODS

On the date in question, 4 November 2022, I was working with Daniel Mannix of the Victorian Dog Training Academy at



a farming property at Garfield, Victoria, where we were doing Snake Avoidance Training for dogs.

Snake Avoidance is an Australian registered trademark (TM No. 1869367), owned by myself.

The snakes used in this Snake Avoidance training are of the exact species the dogs are likely to encounter in Victoria as to train dogs to avoid other unrelated species (e.g. pythons, as is done by trademark infringing imitators) has been shown to be a waste of time, in that it does not work in getting dogs to avoid the relevant species.

Even dogs trained to avoid Tiger Snakes *Notechis scutatus* (Peters, 1861) as a rule do not avoid Eastern Brown Snakes *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854) until trained to avoid those exact snakes.

While the training is complex and involves dealing with numerous factors, it can be explained in overly simple terms to lay persons thus:

1/ A surgically de venomized deadly snake (see Hoser 2004a-b, 2005) is placed on the ground and a dog then walks up to it to investigate or attack it.

2/ At the correct time, a "shock collar" is used to deliver a mild electric shock to the dog. The zapping is done by the licensed dog trainer as he knows the exact time to do so as well as shock intensity and duration. Preferred is when the dog is literally on top of the snake and sniffing it, so that it gets all relevant information and the electric shock is only associated with the snake and nothing else, as may be the case if the dog is zapped when not close to the snake.

3/ There is no association between owner, trainer or snake handler with the snake, or at least so far as the dog can tell and so the dog associates the zapping and electric shock with the snake, nothing else and so learns to avoid the snake, thinking it is the cause.

4/ Because different species of snakes smell different to one another, a dog generally only avoids snakes of the exact kind it is trained to avoid and not others as their scent is unfamiliar to them and they do not associate them with the training. This is why we use all kinds of Victorian deadly snakes (de venomized ones) in our snake avoidance training of all dogs.

5/ For this reason, training a dog using correct techniques to avoid non-venomous snake will not as a rule help them avoid the venomous species.

6/ We know the preceding because over recent years we have dealt with copycats using non-venomous snakes in their trademark infringing snake avoidance training. Many of their clients pets are dying from snake bites, because they did not avoid venomous snakes after their training and as of end 2022, all dogs previously trained by these imitators, that have been checked by us have not avoided a Tiger Snake or Brown Snake when placed on the ground. This is well over 50 such dogs.

By contrast the overwhelming majority of dogs properly trained to avoid venomous snakes do so more than a year later when checked.

In Snake Avoidance Training, the use of de venomized snakes (which I alone in Australia have the expertise to have) is essential to the training and also ensures no risk to dogs at time of training, as would otherwise be the case if normal highly venomous snakes were used.

In terms of the Snake Avoidance Training, only one snake is usually placed on the ground at a time.

This is because most dogs find them easily enough and furthermore there is the issue of watching the snakes out of sight of the dog being trained and making sure the snake/s do not escape.

Relatively unusually, on 4 November 2022, a dog was having trouble finding the snakes on the ground, because as sometimes happens, it was too engrossed in its owner to be concerned about looking out for snakes.

To combat this problem and to be able to train the dog, an adult

male Red-bellied Black Snake *Pseudechis porphyriacus* (Shaw, 1794) and an adult male Eastern Brown Snake *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854) were both placed near one another on a driveway in an open area of the relevant property so that it'd be almost impossible for a passing dog not to notice one or other, or both snakes sitting there, as it was led down the driveway.

Again I note that the dog was not at risk from the venomous snakes as all were surgically de venomized (venomoid) as detailed by Hoser (2004a-b, 2005).

These snakes are essential for Snake Avoidance training and trademark infringing imitators using non-venomous snakes in imitation snake avoidance training, as a rule will fail to train dogs to avoid the venomous species as already outlined.

RESULTS

On 4 November 2022, the snakes were taken out of plastic carry boxes and were relatively cool at the time.

This was deliberate as the snakes being cool do not run away immediately, as would be the case if already warm.

As soon as the snakes were placed on the ground, they immediately flattened out to absorb the warm rays of the sun. The air temperature at the time was well below 20 Degrees Celsius but the sun was shining.

Within sixty seconds the male Red Bellied Black Snake (Black Snake), crawled towards the nearby Eastern Brown Snake (Brown Snake) and began to mount and combat with it.

This is done by mounting the other snake and then using its head and neck, trying to force the other snake down and to the ground, while the other snake either submits or responds in kind. In this case, the Brown Snake responded in kind. The snakes were broken up and placed further apart on the same driveway before Daniel (the dog trainer), the dog owner and their dog approached the snakes as a group. The relevant dog did notice the snakes and avoided them, in line with earlier training, but before I was able to pick them up from the driveway both snakes had crawled towards one another and again commenced male combat. I filmed this altercation.

The relevant snakes were long term captives, both of whom had been surgically de venomized (see Hoser 2004a-b, 2005 for details) more than a decade prior. Both have mated and bred with their own kind in the intervening years (Hoser 2006b).

At the time of the above detailed combat event, each snake had been taken from a cage on their own and placed in a transport box on their own before being driven to the relevant location, about an hour's drive from our facility. Neither snake had in the recent past (months) been in contact with any females of any species or even close to any (other than in the same room at our facility, where they are generally housed, one per cage).

All the snakes used in the training were transported individually in boxes and all snakes used that day (and most others that we do use for Snake Avoidance training) happened to be all males. Of relevance is that the date in question, 4 November 2022 was in the spring mating season and both relevant snakes had been savagely cooled over the previous winter.

As anyone who keeps snakes in indoor set-ups can attest, exposure to the uv and infra red rays of the sun on a cool spring day really does fire up snakes in many ways and so in terms of provoking any potential male combat between the two relevant snakes, all factors were working in favour of such occurring.

Males of the relevant species at our facility do as a rule yield semen if forced to ejaculate in November (Hoser 2008).

It may be trite to note that I could probably recreate this sort of behaviour between other fighting species and genera, e.g. to include Taipans (*Oxyuranus* Kinghorn, 1923 spp.), who have a similar (seasonal) spring mating cycle to the preceding genera, along with the preceding genera involved in this documented case and using surgically de venomized snakes.

I note that in Australia, I alone have de venomized snakes and therefore I alone could initiate this activity without serious risk to

the relevant snakes if I chose to do so.

That is, none of the snakes could possibly die of envenomation in event of a bite.

However the logical question would be, "what is the point?"

Would such cross-genus male combat occur between wild specimens of the same species (Black and Brown)?

I can only speculate, but I would be loathe to say "never".

The more likely answer is that it may occur, but probably very rarely.

More commonly one would probably find one eating the other and this I have seen in both Blacks and Browns eating one another, even when of similar size.

I note however that although when of the same size Brown Snakes normally dictate to the Black Snakes where to go (Hoser 2006a), in terms of who is more likely to eat the other, it definitely goes in favour of the Blacks. The same dichotomy occurs with respect of Tiger Snakes and the relatively closely related to them) Copperheads (*Austrelaps* Worrell, 1963 spp.) (Hoser 2006a).

DISCUSSION

Cross genus matings and combat in snakes is not unknown.

Obviously in captive snakes, combat is not uncommon.

Underlying all this is the fact that most of the time, snakes do not like other snakes and as a rule, prefer to be on their own. In the wild, the less dominant one can flee the dominant one, whether of the same species or another.

It is a well-known fact that in captivity, snakes put together often fight and/or kill one another and so most snake keepers as a rule keep one per cage.

Causes of this combat may include social hierarchies as per Hoser (2006a), or commonly one snake mistaking another for a food item.

No doubt this sort of thing would occur in the wild as well, albeit less often.

In terms of matings, artificial insemination as detailed by Hoser (2008) has opened up opportunities to cross breed snakes in ways never previously dreamt of.

Separate to that, many species of pythons have been hybridized in recent years. The earliest such documented instance were the examples detailed in Hoser (1989) involving a captive Jungle Carpet Python *Morelia cheynei* Wells and Wellington, 1984 successfully mating and breeding with a Water Python *Simalia fuscus* (Peters, 1873) and also a Scrub Python *Australiasis kinghorni* (Stull, 1933).

Photos of the adult young were published in Hoser (1989). (Note: *Simalia* Gray, 1849) has the Water Python as the type species, NOT the Scrub Python as commonly reported on the internet. See Cogger *et al.* (1983) for an explanation with the relevant details, which by default means the taxonomy of Wells and Wellington 1984 and 1985 is in fact correct. The name *Simalia* has been unlawfully promoted by the notorious Wolfgang Wüster and his gang of thieves in recent years as a means of usurping the correct ICZN name for the Scrub Pythons, *Australiasis* Wells and Wellington, 1984 (see Ride *et al.* 1999). The actions of Wüster *et al.* have been in breach of the Australian Copyright Act 1968, Moral Rights Provisions, the relevant parts being within Sections 36, 115, 189-190, 193-195, in particular Sections 195AI (2) and 195AJ (a-b) and 195AQ(2).

More recently and even more significant than the preceding, was the world's first ever case of a Queensland Black-headed Python (male) *Aspidites melanocephalus* Krefft, 1864, mating with a South-east Queensland Carpet Python (female) *Morelia macdowelli* Wells and Wellington, 1984, the cross breeding being by accident. Those eggs were laid on 21 November 2017 (no mating date known or observed).

This breeding was first documented by Hoser (2022).

Based on the young, the father was identified as the Queensland Black-headed Python (originally bred by Neil Sonnemann of

Murungie, Victoria) and the two snakes had occupied a box together when transported to and from reptile shows in the previous 2 years on numerous undocumented occasions. These eggs hatched and young emerged on 30 Jan 2018. 12 of 13 eggs hatched, all this lot being incubated as a single egg mass, as laid, and all young hatched in good health. The non hatching egg was at the centre of the base of the mass and is believed to have died in incubation due to its position in the mass, but the exact reason for non-hatching is not known. That egg was a shrunken and hard mass with no evidence of development when inspected at time of the other eggs hatching. 9 of the 12 snakes ended up surviving to adulthood.

Two died suddenly in their first year at several months of age.

A third snake was stolen at a reptile display on 9 December 2018. It was recovered by the Victoria police in a planned armed raid on the thief, Matthew Christopher Gatt of 12 Domain Drive, Hillside, Victoria, complete with parasitic snake mites 3 weeks later on 31 December 2018. The snake died of mite-borne viral disease shortly thereafter. Matthew Gatt was charged and convicted and fined 8 thousand dollars on 21 March of 2019 (Hoser 2019). Up to 23 March 2022, nine of that litter remained alive and well. Some of those snakes at various ages are depicted (as of 1 January 2023) online at: <https://www.flickr.com/photos/thereptileman/48781145103/> and <https://www.flickr.com/photos/thereptileman/48781160003/> and <https://www.flickr.com/photos/thereptileman/48736752052/> and <https://www.flickr.com/photos/thereptileman/48781549921/> and <https://www.flickr.com/photos/thereptileman/48781479611/>

On 23 March 2022 a large female died from a large inoperable tumour, meaning that as of end 2022 just eight of the original twelve hatchlings born four years earlier remained alive.

All were males bar one runt female that was physically similar to the two others that died suddenly in the first year.

This situation effectively prevented any future breedings of this lineage of snakes, especially as the male Black-headed Python that mated the female South-east Queensland Carpet Python also died in 2022.

As of the time of publishing this paper, all eight remaining snakes hatched on 30 Jan 2018 appeared to be in perfect health.

As mentioned already, I again note that "Snake Avoidance" is an Australian registered trademark (TM No. 1869367). I have owned the trademark for many years. Unauthorised use for the purposes of training dogs in Australia, or for dissemination of information, including promotions and advertising, is expressly forbidden. This includes for any deceptively similar variants such as "Snake avoidance Victoria" or "Canine Snake Avoidance".

CONCLUSIONS

While the primary purpose of this paper has been to report on the world's first ever cross genus male combat in dangerously venomous elapid snakes, or for that matter any kind of elapid snake, it is also worth mentioning that this resulting observation was only possible with the use of surgically de venomized snakes.

It would not have been allowed to potentially happen with two captive snakes that could potentially envenomate and kill one another.

The circumstances leading to this world first observation only happened in the shadow of the relevant snakes being surgically de venomized and used in dog snake avoidance training at the time.

These "venomoid" snakes as they are known, have had numerous beneficial applications both for people and the snakes themselves as detailed by Hoser (2004a-b, 2005), including the scientific findings reported in Hoser (2006a and 2007) as well as other papers not cited here.

But significantly, by far the best outcome of the development of surgically de venomized snakes has been the parallel development of Snake Avoidance training for dogs.

This has saved the lives of hundreds of the thousands of dogs

we have trained (the majority would not have died of snakebite, so it is not as if the training was a waste of time, but rather that not all dogs trained to avoid venomous snakes actually ever encounter any).

Also the training has saved the lives of many hundreds of venomous snakes as the dogs that would otherwise have attacked and killed them, have instead run away from them as we had trained them.

Hence the positive wildlife conservation implications of the venomoid snakes should not be ignored.

In fact the positive wildlife conservation implications of venomoid snakes should be utilized further to protect threatened and vulnerable species of snake from dog attacks as required, if and when such attacks are possible or likely.

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CONFLICTS OF INTEREST

None.



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