

World's Worst Venoms

T/C	TEASE:
10:00:03	It's one of nature's most efficient ways to kill.
10:00:07	Once injected into the bloodstream it can damage nerves and flesh in minutes... and trigger searing pain in seconds.
10:00:16	This is venom – a virulent biological toxin...and the weapon of choice for thousands of species
10.00.23	But which one is the most deadly to man?
10.00.28	Of those creatures armed with this lethal cocktail, which is more likely to kill you?
TITLE: World's Worst Venom	
PART ONE:	
10.00.37	Among the world's venomous creatures there are those whose reputations are infamous, but there are many less well-known killers out there.
10.00.49	Everything from molluscs to fish may be armed with onboard biological weapons that are 100% natural and, in many cases, deadly.
10.01.01	But when it comes to human beings, there's always been a great deal of debate as to which of these creatures presents the greatest threat.
10.01.10	It has inspired one man to come up with a pioneering new system for ranking the world's most dangerous venoms.
10.01.18	Dr Jamie Seymour is a venom biologist at James Cook University in Queensland, Australia.
10.01.25	<i>I/V Dr J.S. We wanna take the terrestrial snakes, we wanna take the marine snakes, and we wanna take the marine animals and we wanna take the whole lot and bring them all together and test that</i>

	<i>venom drop for drop and then we wanna put in things like how aggressive the animals are and what their population distribution is</i>
10.01.43	This ranking system allows Jamie Seymour to understand the different threats posed by venomous creatures - and ultimately to identify measures for minimizing the risks.
10.01.55	It consists of five categories. The first is <u>Opportunity</u> – or how likely is it that the creature will have the chance to bite?
10.02.04	Those venomous creatures living in heavily populated areas will score far higher
10.02.11	Next comes <u>Aggression</u> – we are more likely to become victims of aggressive rather than shy species.
10.02.19	Then there's <u>the Injection Mechanism</u> - how well does the animal deliver its venom?
10.02.26	Related to this is <u>Quantity</u> , in short - the amount of venom delivered in a single bite or sting.
10.02.34	Last but not least is <u>Potency</u> , - just how toxic is the venom - drop for deadly drop?
10.02.42	Considering these 5 factors <u>together</u> is a brand new approach
	<i>Dr J.S</i>
10.02.48	<i>That will allow us to compare for the first time ever all these venomous animals and come up with what is the most lethal animal to humans not to sure what that will be yet but I think we are going to find a few surprises along the way.</i>
10.03.02	Let's take a look at the weapon itself.
10.03.07	While most of us will have heard of venom, how many actually know what it is?
10.03.13	Venom is a mixture of biological toxins. Unlike a <u>poison</u> which must be swallowed or absorbed through the skin, venom is <u>injected</u> into the body during a sting or a bite.
10.03.28	It can be used for hunting, by disabling prey, or as a defensive weapon in the face of attack.
10.03.36	The difference in strength and how the venom functions will have a significant effect on how it works on the human body.
10.03.44	Something that Jamie Seymour has learned first hand

10.03.50	His new study will take him up against the creature that most people think of when they hear the word venom: the snake.
10.03.59	There are more than 30 species of <u>rattlesnake</u> alone, all carrying different venoms.
10.04.06	While some venoms target the body's nervous system, creating havoc with the complex network of nerves that control its vital functions, others attack flesh and tissue, effectively starting the digestive process before the victim is even eaten.
10.04.23	Having bitten its prey, the rattlesnake waits for the venom to take effect before feeding.
10.04.37	Someone who has handled plenty of these creatures over the years is Jules Sylvester.
10.04.45	He's been helping moviemakers to get their dangerous animal footage for many years.
10.04.51	And he's taking Jamie to find North America's most dangerous rattlesnakes and get a venom sample for future testing.
10.05.00	But in this rugged terrain this MEDIUM-SIZED RATTLER is extremely difficult to spot if you don't know what to look for.
10.05.10	You can be standing right on top of a metre long Mojave and still not see it, so Jamie Seymour has taken the precaution of wearing bite-proof kevlar leg protectors.
	<i>SYNC: JULES</i>
10.05.23	<i>Oh Jules...jules...That's a mojave – very very potent neurotoxin most unusual because most rattlesnakes are haemotoxin, that's neurotoxin.</i>
10.05.33	The mojave's venom is a complex cocktail of enzymes and other proteins forming an incredibly strong neurotoxin – designed to block the firing of nerves, particularly those controlling the muscles... it's the quickest way to stop prey in its tracks.
10.05.53	Knock nerves out and it's game over. It's paralysis, even death.
10.06.00	The mojave rattlesnake is not the only rattler in these parts. In the desert nearby is the larger and more infamous western diamondback.
	<i>Sync: Jules and dr J.S.</i>

10.06.08	<i>he's coming back out again, hang on</i>
10.06.11	But despite their overlapping territories each has a very different venom.
10.06.14	– <i>gotcha! Yeah, got him (laughs)</i>
10.06.19	The Western Diamondback carries haemotoxic venom that attacks blood vessels. Like many snake venoms it starts the chemical breakdown of flesh even before the victim is eaten.
	<i>Sync: Jules and Dr J.S.</i>
10.06.32	<i>That is your classic western diamond back rattle-snake...that's the one you see in all the westerns? All the cowboy movies, this is the best Hollywood snake in the world. These guys account for more snake bites than any other snake in the country. "He's obvious the rattle is making a noise...what is he doing that for?" "It's a warning to bison like; a go away and leave me alone.</i>
10.06.53	The Western Diamondback is more widespread and likely to be found at the edge of towns and cities
10.07.07	Another American rattler has adapted to a rather different habitat. The Southern Pacific rattlesnake prefers the green coastal climate of the Hollywood hills.
10.07.17 M&E NOTE	NEED A SFX ON THE CRASH ZOOM TO HOLLYWOOD SIGN AND ALSO FOR MUSIC TO START HARD IN ON THIS SCENE
	<i>Sync: Jules</i>
10.07.17	<i>The Southern Pacific rattlesnake is the only one that's venomous in the L.A area even though we've got thick bush here we're one hour from Hollywood.</i>
10.07.25	Previously categorized as a B-Grade or low risk, this species is now emerging as a major threat to people living in the Los Angeles basin.
10.07.35	As specialist snakebite physician Dr Sean Bush knows only too well
	<i>I/V Dr Sean Bush</i>
10.07.40	<i>Mostly we see Southern Pacific rattlesnake bites because those snakes live where the people like to live – that is, along the coastline and up into the mountains.</i>

10.07.49	These snakes often stray into peoples driveways and backyards and though it may be tempting to try and remove them, it is always best to exercise caution and call for help, as this man discovered the hard way
	<i>Sync: man in bed:</i>
10.08.02	<i>Took things into my own hands and made a big mistake. Within an hour or two, my hand was blown up like a balloon.</i>
10.08.13	This hospital is used to treating several snakebites a day...
10.08.18	...And when Dr Bush received a phone call to let him know his own child had been bitten, he feared the worst.
	EOP1 – 10.08.23.15
	PART TWO:
	<i>Sync: Dr Sean Bush</i>
10.08.29	<i>My son was actually in the backyard and had picked up a little rattlesnake and got bit...we actually had five snake bite patients in the hospital that day ... my wife pages me 911 emergency and tells me Jude has been bitten by a rattle snake, I've seen bad things happen to people with snake bites. Fortunately he did well; his hand is a little bruised right now. He has a little trepidation around snakes now which maybe he should.</i>
	<i>Sync: Dr Bush and son</i>
10.09.02	<i>Are you gonna touch it? ... I'm not gonna touch it again.</i>
10.09.06	<i>Can you say bye bye snake? ...Bye Bye! Bye snake...</i>
10.09.13	Despite the tell-tale menacing sound, the rattlesnake is in fact one of the easiest venomous snakes to avoid.
10.09.22	The rattle is a benign early warning system, a device for making sure that anything that comes near is made aware of its presence.
10.09.39	A venomous snake stores its venom in glands just behind the eye where it can rapidly supply venom to the injection mechanism - either hypodermic-like fangs or finely grooved teeth.
10.09.54	The fangs of rattlesnakes are hinged, rotating down into a stabbing position just before a strike.
10.10.03	So how do the rattlesnakes we have seen so far score against Dr Seymour's ranking

	system? One is particularly dangerous to man.
10.10.14	It's the notorious Western Diamond Back
10.10.18	Because this rattler is now commonly seen around southern U.S. towns, it has more opportunity to strike at people, which given its bold aggressive nature, it frequently does!
10.10.31	It's large, hinged fangs penetrate deeply into its victim to deliver its venom.
10.10.36	And though not as potent as that of other rattlers, it can deliver enough venom to be potentially fatal if a bite goes untreated.
10.10.47	The Western Diamondback is responsible for the most bites and deaths by any reptile in the United States.
10.10.58	Next we head 12,000 kms away to Africa where we discover a snake whose fangs dwarf those of any rattlesnake.
10.11.07	Much of Africa's West and Central regions are still covered by thick forest. It's here along the forest's edges that we find a snake with a particularly dreadful reputation.
10.11.19	When it comes to death by lethal injection, the Gaboon viper really can deliver
10.11.25	This solid bodied, one and a half metre but slow moving snake is a superbly camouflaged ambush predator. It's so well disguised that it's nearly impossible to see it, even when you know its there!
10.11.40	Through its five-and-a-half a centimetre fangs, the longest of any snake, it injects the largest quantity of venom in the snake world.
10.11.52	This is thankfully not an aggressive species preferring to retreat rather than attack if approached.
10.12.04	For any snake, envenomation of a human being is a waste of time and energy.
10.12.14	A snake who's injected valuable venom into a human victim may have less chance of hunting prey or defending itself from attack until it has replenished its toxic supplies.

10.12.27	And there are plenty of animals that will attack even the most venomous species of snake.
10.12.32	Like the mongoose.
10.12.37	And in Mozambique they face a snake that can deliver its venom long distance.
10.12.46	The Spitting Cobra takes the defensive use of venom into a whole new league.
10.12.53	Squirting venom with astonishing accuracy.
10.13.00	Muscular contractions squeeze venom through the fangs, spraying it up to three metres at the eyes of any aggressor, causing irritation and blurry vision.
10.13.12	But there is another African snake more deadly than the cobra - The highly confrontational saw-scaled viper.
10.13.20	With its subtle signature sound – it inhabits a vast natural range which stretches from North Africa across the Middle East and into Asia to include areas of mass human population, well over a billion people in all.
10.13.37	Giving this aggressive serpent plenty of opportunity to bite.
10.13.43	Professor Julian White is a medical expert in diagnosing snake bites.
	<i>Sync: Prof JULIAN WHITE</i>
10.13.48	<i>10 percent approximately of acute hospital beds in Nigeria are occupied by snake bite patients and the overwhelming proportion of those are saw scaled viper bites.</i>
10.13.59	It's huge range and the fact that victims are often a long way from proper medical treatment, ensure this is a serious bite risk species.
10.14.11	So - while the Gaboon Viper has the most formidable set of fangs and is physically the more intimidating, it is actually the smaller saw-scaled viper that is the greatest threat to people living in its territory.

10.14.25	This deadly predator gets plenty of Opportunity to strike
10.14.30	And unfortunately, it is also extremely bad tempered and is often known to attack humans.
10.14.37	Despite its small size, it has an impressive set of folding fangs, which can inject a fatal dose of moderately toxic venom.
10.14.46	All in all, it kills thousands of people every year.
10.14.50	7000 kilometres away in Asia we find several other contenders for the world's worst venom. While most people try to avoid close contact with venomous snakes, here there are some who court danger on a daily basis.
10.15.08	Sacred among Buddhists and Hindus the Asiatic Cobra is a confident species and will bite, if alarmed.
10.15.16	The Asiatic Cobra is also a bit of a show-off and its threat posture has become an iconic symbol of Asia.
10.15.28	Coming face-to-face with these snakes, Thai snake charmers uphold a tradition that goes back thousands of years.
10.15.36	If any snake had an opportunity to bite, handed to it on a plate, it would be this one.
10.15.44	Two charmers in this village alone have been bitten recently.
10.15.50	But the Asiatic Cobra is dwarfed by a gigantic relative, the longest of all venomous snakes – the King Cobra.
10.16.00	At over five metres in length, the King Cobra can raise enough of its body from the ground to stare a standing human in the face.
10.16.11	Some have lived to tell the tale.
	<i>Sync: LOCAL BITE MAN</i>
10.16.17	<i>I've been bitten 19 times by the King Cobra and I survive . Many people in our group have been bitten by snakes – it's not just me, it's more than ten of us. I will keep performing until I die.</i>
10.16.40	Many of the charmers who work with King Cobras believe they have a high level of intelligence... and it's possible the reptilian performers only deliver "dry" warning bites,

10.16.53	injecting minimal venom. In the wild, they mostly save their huge venom capacity for their favourite prey, other snakes.
10.17.04	However, this part of Asia does have a problem with another more irritable snake - The Russells viper
	<i>Sync: Prof White</i>
10.17.12	<i>Russell's viper is especially nasty through out its range it not only causes kidney damage, nasty bleeding effects and in some places, particular Sri Lanka it can cause degrees of paralysis and muscle damage as well.</i>
10.17.29	This snake is one of the most dangerous in all of Asia. Preferring the outskirts of cities, it kills thousands every year.
10.17.40	Why are so many people bitten by this species?
10.17.46	There are two times a year when Russells viper bites reach a peak. They coincide with the planting and harvesting of the rice fields.
10.18.01	Many of this snakes victims are farmers whose remote, rural location prevents them from getting the immediate medical attention this bite requires.
10.18.12	It can take days before a victim can reach hospital, long enough for the venom to do serious damage.
10.18.20	The Russell's viper strikes at close range and a single bite can deliver over 100 milligrams of venom.
10.18.32	As the venom diffuses into the blood stream it interrupts the blood-clotting mechanism leading to haemoraging and finally to devastating kidney damage.
10.18.44	Let's consider the worse case scenario. What do you do if you are bitten by a venomous snake?
10.18.49	Forget sucking out the venom, that's strictly for the movies.
10.18.56	Wherever you are in the world, a serious venomous snake bite without proper medical attention can lead to permanent injury or even death.
10.19.07	In most cases you need an injection of Antivenom. This is an antidote created by

	injecting small amounts of the true venom into a host animal such as a horse.
10.19.19	The immune response which follows produces antibodies against the venom. These are harvested from the animal's blood to make antivenom.
10.19.28	<i>Sync I/V Dr J.S. We use predominantly horses because one they are big and you can get large volumes of blood from them without causing any problems to the horses. Second thing is there isn't a great deal of diseases that can be passed on from horse to humans. What basically happens is you take the venom and inject it into a large horse and then overtime you increase the amount of venom that you give to it, what the horse does is that its immune system then starts to develop anti-bodies, if you think this chewing gum is the antibody and I'm the horse, and what happens is because the venom is a particular shape and its going to act and lock in like a key, if you take the antibody and wrap that up, that key will no longer work, so it will float free in the body but it wont be able to lock on to the cells cause death to humans.</i>
10.20.22	While anti venom will neutralize the toxin they cannot reverse the process of any damage that's already done. Being monitored in hospital is often essential.
10.20.36	But there's one snakebite where even without anti venom, it is possible to survive.
10.20.42	The Malayan Krait is one of the few Asian snakes carrying a purely neurotoxic venom.
10.20.48	As a nocturnal hunter it stalks its prey in darkness by following scent trails, often entering through an open window or door.
10.21.01	And the sleeping inhabitants may never even know they've been bitten, especially since the fangs are very small.
10.21.12	As the neurotoxin goes to work, it's only the unnerving paralysis on waking that points to a snakebite in the night. The toxin blocks nerve endings that control muscles, including the rib muscles vital for breathing.
10.21.28	But unusually, this venom can work its course through the body... and as long as the victim can be kept breathing through the paralyzing effects, they are likely to survive.
10.21.42	While both Russell's viper and Malaysian Krait present a serious threat to Southern Asia's human population, it's the cobra that is the greatest danger here.
10.21.52	Not the mighty King Cobra – the largest venomous snake in the world – but its smaller cousin, the common cobra.

10.21.59	And again, we turn to Jamie Seymour's new classification system
10.22.06	The Asiatic Cobra is most commonly found on the Indian Sub continent, but its habitat extends further into Southern Asia, and it shares its living space with millions of people.
10.22.19	Its confidence also contributes to it biting up to 15,000 people every year
10.22.26	While its fangs are not the biggest, the snake does produce a surprisingly large volume of venom
10.23.35	Thankfully its venom only scores moderately on our potency scale. Nevertheless it remains one of the biggest killers in the venomous world.
10.22.48	But there is one country that tops all the others put together in the venomous snake stakes.
10.22.54	Australia. It's species of venomous snake outnumber the non-venomous ones.
	<i>Sync: Dr J.S.</i>
10.23.04	<i>We have the most venomous snakes there is no doubt about that ... they're are all incredibly venomous.</i>
10.23.10	Australia is a big place with vast areas of unpopulated country. The snakes that live here are hardly pushed for space.
10.23.20	Yet alarmingly there are seriously venomous species that have adapted perfectly to the urban lifestyle of Australia's cities.
10.23.28	Some Eastern Brown snake populations now thrive on a diet almost entirely consisting of house mice.
10.23.37	A great pest control perhaps, but being caught by the jaws of this mousetrap is surely worse than having a bad rodent problem, and they inject a good deal more venom than was previously thought and like a lot of city dwellers they're easily annoyed.
10.23.53	The venom of the Eastern brown is particularly unusual because it causes the blood to clot rapidly. However, if you survive you may later die from haemorrhaging.

10.24.05	But only by travelling to the remote regions of the Australian outback can we find the even more venomous and ominously named Fierce Snake.
	<i>Sync Dr J.S.</i>
10.24.13	<i>If that snake with that venom was present in a highly populated area I suspect that you would be dragging people out of the bush left right and centre as they died.</i>
10.24.23	The Fierce Snake is also known as the Inland Taipan - it inhabits a harsh and extremely demanding environment.
10.24.35	They specialise in hunting native desert mammals, and tracking prey down takes valuable energy so failure is not an option.
	<i>Sync Dr J.S.</i>
10.24.45	<i>When the prey turns up you want to make sure you grab it you want to make sure you inject it and you want to make sure it is going to die so you give it a very potent venom and you give it a heap of it.</i>
10.24.55	But fierce by name does not necessarily mean fierce by nature. This snake - with the most lethal venom known for any land animal – is hardly ever seen by a human being.
10.25.10	It hunts and lives in holes and subterranean tunnels rarely venturing into the open.
10.25.18	But very similar toxins to those found in the Fierce snake can also be found in a snake much closer to home.
	EOP2 - 10.25.27
	PART THREE:
10.25.30	Around Australia's coastlines we find a highly venomous sea serpent.
10.25.36	The olive sea snake is gregarious and confident around human beings and can frequently approach divers and snorkellers.
10.25.48	After 10 years working with them, sea snake expert Glen Burns knows how to handle them safely.
10.26.00	SYNC: GLEN BURNS

10.26.08	<i>The male, he'll be searching for females at the right time of year, any movement he is usually attracted to. Which is why a lot of divers think they are being attacked. The male will come zooming up from the bottom basically because they don't see very well they think it is a potential mate and they come zooming over to investigate.</i>
10.26.26	They need a powerful fast acting venom, if they don't disable the fish quickly it will escape and the meal is lost.
10.26.36	But of all Australian snakes its not the sea snake that comes out top nor is it the serpent with the strongest of all venoms – the Fierce Snake.
10.26.47	In Australia, its the Eastern Brown Snake which ranks as the most dangerous to people
10.26.54	It is aggressive and fast moving snake.
10.27.00	Fortunately, its fangs are relatively small, and it rarely manages to cut through heavy clothing.
10.27.10	Historically Eastern browns were thought to produce a tiny amount of venom, but recent studies suggest that this is not the case
10.27.21	And their venom has a rare blood clotting quality, which if delivered directly into the blood stream, can kill a human in minutes.
10.27.36	Australia does have more than its fair share of venomous creatures, and they're not all snakes...
10.27.43	There are hundreds of other species that can sting and bite.
10.27.54	This is the Sydney funnel web spider. As its name suggests it lives in and around the city where it's known to have killed at least thirteen people.
	<i>I/V Prof J White</i>
10.28.06	<i>These are the only spiders in the world that are truly lethal prior to the development of anti-venom there was nothing that medicine could do to guarantee survival even in an adult from a major funnel web spider bite.</i>
10.28.20	Both male and female spiders carry venom used for killing their insect prey. But it's the males extra venom component that is a danger to people. The females seldom leave

	their underground burrows whereas males often wander in search of females.
	<i>Sync: Dr. J.S.</i>
10.28.40	<i>It is the males that are more potent to humans. Part of the reason is when you look at males they come out of there burrows and they go foraging the females stay within the burrows and stay put.</i>
10.28.54	Staying hidden helps to avoid predators, but for the times when it does venture out into the open, the spider has developed a highly potent toxin which it can use if threatened.
10.29.07	<i>...Once you come out of your burrow you are then exposed to predators your predators will be marsupials and things of that nature so you have to have this extra component in your venom that you can use for defence.</i>
10.29.21	There's another venomous Australian spider that resides far beyond the city limits – the Redback, and its notorious for lurking in dark dry places, often right under your nose.
	<i>Sync: Prof J White</i>
10.29.33	<i>In Australia more antivenom is used to treat red back spider bite then all other spider bites combined including snake bite it is a very common problem it is probably greater then a 1000 cases receiving antivenom every year.</i>
10.29.47	And this species is also well traveled, they have a fondness for long-haul luggage and they've found themselves 7000km away in the port of Osaka, Japan.
	<i>Sync: Prof J White</i>
10.29.58	<i>Prof JULIAN WHITE "It arrived on the Osaka docks probably around 1994 and quickly spread so that by 1996 there were probably hundreds of thousands of red back spiders in Osaka. I found higher concentrations around the dock area then you would see even in Australia.</i>
10.30.17	Back in his North Australian lab, Jamie Seymour takes a closer look at these spider venoms
10.30.25	And it is the Sydney Funnel Web that poses the greatest threat to humans, according to the five point scale.
10.30.35	During the mating season, funnel web males are drawn into gardens and houses, increasing the likelihood of a human encounter.
10.30.45	And though it might rather avoid confrontation, it will not shy away from defending itself.

10.30.52	Despite feeding mainly on insects, its fangs are long enough to pierce human skin and deliver a small quantity of highly potent venom.
10.31.07	Back on our quest to find for the 'world's worst venoms' Dr Jamie Seymour and venom enthusiast Jules Sylvester head back to the desert in search of the only lethal species of scorpion in the United States: The Arizona Bark Scorpion.
10.31.26	While spiders and snakes deliver their venom through fangs to inject it into the blood stream, the scorpion uses its sting in the tail.
	<i>Sync: Prof Julian White</i>
10.31.36	<i>Prof White "After snakebite, scorpion sting is probably the medically most significant cause of envenoming in the world, we have no idea how many people are affected but I would suggest it's probably in the millions.</i>
10.31.48	Jamie Seymour is back with Jules Sylvester, this time carrying an ultra violet light to bring out the natural fluorescence of the scorpion's hard external skeleton .
	<i>Sync: Jules and Dr J.S.</i>
10.31.58	<i>This is a big one but not the bad one, try under that piece of bark...up the top there. oh, it's a bark scorpion ...grab him, grab him, did you get one? yup...absolutely. You got a bark scorpion, look at that...up to like, ten years ago, they were losing about 800 people in Mexico just because of this...seriously? But with the advent of the anti-venin that's fixed that? ... Improved it a lot.</i>
10.32.29	Found in The American Southwest and northern Mexico the bark scorpion does encounter human beings fairly often, but is unlikely to sting unless provoked.
10.32.43	Being small in stature it has a relatively modest stinger delivering small quantities of venom.
10.32.48	But compensating for its lack of size its venom is relatively potent, and prior to the development of proper antivenoms it was a much feared killer.
10.33.02	It's back in Africa that we find two other particularly notorious scorpions.
10.33.10	This is the powerfully-built fat-tailed scorpion. It grows up to 10cm in length.
10.33.18	Though its sting is designed to immobilize insects it can have an equally potent affect on a child. Although this species rarely ever injects enough venom to kill a healthy adult.

10.33.34	The distinguishing feature of most Scorpion stings is that the toxins they contain have a very different effect on the nervous system than any of the snakes we've seen. Sending it into a kind of physiological overdrive, with heart rate and blood pressure sent soaring.
10.33.54	Another African scorpion is a wolf in sheep's clothing.
10.34.00	The 'Death Stalker' more than compensates for its small size and unimpressive looking stinger by having more toxic venom, drop for drop, than any other species of scorpion.
10.34.18	Jamie Seymour's scale highlights why it is so deadly.
10.34.23	Opportunity to strike is high: it's the cause of many stings throughout the Middle East and North Africa where it lurks
10.34.34	For Aggression it also ranks highly - they can be very volatile.
10.34.41	It has a highly effective stinger, that easily penetrates human skin
10.34.48	Scorpions restrict the tiny amounts of precious venom they administer with every sting...
10.34.54	..Which is fortunate because the death stalker has extremely potent venom which can cause heart and respiratory failure if injected into a person's blood stream.
10.35.09	For our final group of venomous creatures we return to Australia, but this time we're underwater.
10.35.18	Everything Jamie Seymour needs for this category is right on his own doorstep. Australian waters contain many species of dangerous marine stingers and biters, but sometimes it's not the venom which delivers the lethal blow.
10.35.32	And he was present on a particularly fateful day.
	Sync: Dr J.S.
10.35.38	<i>When Steve Irwin was stung ...</i>
	<i>When Steve Irwin was stung by the sting ray I was on board and had been for a couple of days with Steve ... what appears to have happened is Steve's swum over the back of the sting-ray. From the animals point of view there's a big shape coming over the top of it - big shape means big predator.</i>
10.36.00	It was not the Stingrays venom that actually killed Irwin. It was the puncture wound from the ray's spine.

	<i>Sync: Dr J.S.</i>
10.36.08	<i>It's not unusual to see certainly in tiger sharks and other big sharks these holes or these gaping wounds around the middle of the shark or down through the gills...think of this as really a sharp knife so if that's embedded in your chest and ends up unfortunately in somewhere like your heart ... it's not the venom that does the damage in humans it's more the physical damage from these big spines.</i>
10.36.33	There are other marine creatures here that are lethal to human beings.
10.36.38	This is the Blue-Ringed Octopus.
10.36.42	And this is Dr Mark Norman - he's an octopus expert at Museum Victoria.
	<i>Sync: Dr M. Norman</i>
10.36.47	<i>These octopuses are equipped with a really good warning system and its using brilliant blue rings to flash like police lights to say I am really deadly and if you come too close I'll bite you.</i>
10.37.02	The venom it carries consists of a highly specialized protein called a tetrodotoxin. It has evolved to paralyse prey, like crabs, quickly.
10.37.13	The venom is supplied to the razor-sharp parrot-like beak from large venom glands deep inside the octopus's body, immobilizing its prey and they have an equally disastrous effect on the human body.
10.37.26	<i>Sync: In situations where people have died from the bites of these octopuses they've been handling them and they've bitten with this very powerful saliva going into their bloodstream and within three minutes they're paralysed and they've suffocate to death ... and in one case in the 1950s two divers had one they threw him to each other on the beach. The more they threw it too each other the brighter the blue rings got and the guy put the octopus onto his shoulder and said I'll take it up the car park and show the 'missus' and while he's walking up the car park its bitten straight into his jugular and he was dead in two minutes.</i>
10.38.05	Worse still on the list of Australia's most deadly venomous creatures is the harmless looking box jellyfish.
10.38.21	Each tentacle is armed with millions of minute spring –loaded stinging capsules. They inject venom into blood vessels just beneath the skin where its travels rapidly through the blood stream and eventually to the heart.

10.38.40	And unfortunately, it inhabits inshore waters, the kind frequented by swimmers.
10.38.49	Jamie Seymour has been on the wrong end of the box jellies tentacles more than once.
	<i>Sync: Dr J.S.</i>
10.38.59	<i>And I've got to tell you it hurts it is almost a surreal pain. It reaches its peak level almost instantaneously and stays at that level for about 10 to 15 maybe 20 minutes and then it just shuts off.</i>
10.39.14	To protect swimmers from the box jelly fish special nets at the most popular beaches keep them well apart.
	<i>Sync: Dr J.S.</i>
10.39.20	<i>You see these stinger nets all over the place...they do a wonderful job we've never had a fatality or a near fatality sting inside the nets. If you swim outside the net it is not a matter of if you get stung it is when you'll get stung. It is really playing with your life.</i>
10.39.33	But the net's which do a good job of keeping the deadly box jellyfish out are no barrier against another member of the jellyfish family - one of the smallest killers in the ocean. along coastlines and reefs from Australia to South East Asia is the miniscule Irukanji jellyfish.
10.39.52	<i>Sync: Dr J.S.</i>
	<i>We started getting jellyfish stings of some sorts from inside nets - they weren't big box jelly fish stings they were distinctly different - they were showing distinctly different symptoms.</i>
10.40.02	Often no larger than a pea, no normal stinger mesh can keep out the tiny Irukandji jellyfish.
	<i>Sync: Dr J.S.</i>
10.40.15	<i>As I duck dived down I got stung across the top of the lip.</i>
10.40.18	But unlike the box jellyfish the venom of the Irukanji lingers in the victim's tissues.
10.40.26	It's this that gives the sting a delayed reaction. Seymour suspects that it's only when the toxins reach the bodies lymph glands that the painful effects kick in.
	<i>Sync: Dr J.S.</i>
10.40.38	<i>I had these severe stomach cramps, pins and needles through the lower joints and the legs like you would not believe and we're now getting large quantities of pain killers, it was just hell on</i>

	<i>earth.</i>
10.40.55	Far less dangerous to people but fatal to fish is another bizarre marine killer – the cone shell.
10.41.05	Whereas most venom’s lethal impacts are based on just a few key proteins, that of the cone snail contains hundreds of toxic compounds. Among them are nerve blocking chemicals that can induce instantaneous seizure and a strong sedative that prevents the prey from struggling.
10.41.22	But like most snails this one operates at a pretty sedate pace. It only needs to feed once a week and its super-strong venom guarantees that when it does hunt down prey it almost always makes a kill.
10.41.36	However, scientists have actually discovered a way to utilize this venom as a super-strong painkiller.
	<i>Sync Dr J.S.</i>
10.41.43	<i>These animals are cone snails and they’re basically little chemists... there’s already been a painkiller that’s been extracted from the venom and who knows what else may be in there.</i>
10.41.56	Scientists are now beginning to explore the possibilities of using its natural properties to treat serious diseases of the human body.
10.42.04	As research continues into the medicinal potential of venom - in the natural world its still a formidable weapon.
10.42.11	And in the ocean the deadliest of all venomous creatures is the box jellyfish.
10.42.16	It inhabits waters surrounding many popular beaches, where stinger nets are deployed to keep bathers safe.
10.42.26	It is not an aggressive creature and won’t deliberately attack a human being but nor is it likely to get out of the way
10.42.38	When fully grown it has over 120 meters of tentacles, armed with millions of tiny stinging capsules , making it highly effective at injecting its venom
10.42.48	The amount delivered depends on how severe the contact with its highly armed tentacles

10.42.59	And it gets worse – the venom it delivers may well be the fastest acting and, drop for drop, one of the deadliest known against people. In severe cases death can occur in just two minutes, before any chance of medical help.
10.43.14	Of all the creatures we've seen in action, from the rattlesnakes of the United States and the venomous spiders of Eastern Australia to octopus and jellyfish which one is responsible for the greatest number of human fatalities?
10.43.31	According to Dr Seymour's ranking system, we can focus on three final contenders for the title.
10.43.36	From the reptile world it's the feisty saw-scaled viper, which narrowly edges out the common asian cobra and Russells viper, to be the worlds most dangerous serpent.
10.43.48	Among the spiders and scorpions its the death stalker that tops the lethal list, and from the marine contenders, it's the ghostly box jelly fish.
10.44.05	Surprisingly, many creatures with extremely toxic venoms, measured drop for drop, don't feature amongst our finalists. Simply because they don't get the chance to encounter humans often enough to rate among those most dangerous to people.
10.44.28	But there is one merchant of venom that narrowly defeats all the others in the danger it poses.
	EOP3 – 10.44.38
	PART FOUR:
10.44.41	According to our key criteria, the most dangerous venomous creature on earth lacks a big hollywood reputation. In fact few of us will have heard of it untill now - the saw-scaled viper.
10.44.54	<i>I/V Dr J.S</i> <i>You find them through North Africa, Asia and the Middle East. Through that area there is something like a billion people inhabit that area and something like 60/70/80 100,000 people a year get bitten. Out of that 20,000 people die each year.</i>
10.45.12	Its lethal credentials include a highly potent venom but what really sends the fatality rate soaring sky high is a unique combination of this snake's aggression and proximity to people, making rapid and efficient medical treatment crucial for survival.
10.45.28	<i>I/V Dr J.S.</i> <i>Its not because this animal has such a lethal venom that people are bitten and die instantly, its because they cant get the medical help quickly enough or they don't have good anti venoms.</i>

10.45.42	Reducing the human death rate from venomous bites and stings means making sure that more people in bite risk zones can get fast and effective treatment.
10.45.54	And there is another crucial factor in determining the toxicity of any venom.
10.45.59	Among the creatures we've already seen there are extremely variable reactions to their bites and stings.
10.46.12	Take the Sydney funnel web, potentially deadly to humans - its venom has almost no effect on the local cat and dog population.
10.46.22	This venom appears to be especially toxic to monkeys and humans but harmless to felines and canines.
10.46.30	However, when it comes to the bite of the North Queensland Tarantula, it's the other way around - human beings suffer localised pain, while cats and dogs usually die.
10.46.41	And surprisingly it is a specific reaction to venom that makes one species an unlikely mass killer.
10.46.50	The humble honey bee.
10.46.53	While many of us would shudder at the prospect of venomous snakes and scorpions in our back yard – its actually bee stings that kill more people in the western world than any other species.
10.47.03	<i>Sync: Dr. J.S</i> <i>Its not direct effects of the venom, but its because people go through what is known as anaphylactic shocks, in other words they are allergic to these bee venoms and things happen like the muscles around your neck swell up and you stop breathing and that's what kills.</i>
10.47.20	Such a significant difference in reaction to venoms has also inspired Jamie Seymour to plan another element for his venom rating system.
10.47.31	Lab based experiments designed to find out exactly how severely each of the world's most toxic venoms actually attacks human cells.
10.47.39	The reason for this is simple.

	<i>Sync Dr. J.S.</i>
10.47.42	<i>What they've done routinely is to test these on mice or rats, which works well if you want to know how lethal these are on rats and mice but it doesn't tell you anything about how lethal they are on human cells."</i>
10.47.56	So far Jamie Seymour has begun experiments on Human heart Cell's, not people of course but cell cultures specially grown for the purpose.
10.48.03	<i>JAMIE SOT: "These containers are the key to everything we're been doing, basically what we've able to do is to grow human cells. We'll have about 10 thousand cells in each of these wells...we can add venom from any sort of animal we want ...having done that we can add a red dye to it and those cells will stain up red as the cells die, and the more and more cells dye the redder the stain becomes.</i>
10.48.27	The results are already proving invaluable.
10.48.31	Venom from the controversial Sydney funnelweb spider has been confirmed highly toxic, exceeding the drop for drop potency of the the deadliest scorpions tested.
10.48.42	Among the reptiles the most toxic venom tested belonged to the inland taipan, killing over 60% of heart cells in the first 10 minutes. Thankfully this snake remains remote from human contact in the Australian outback.
10.48.56	But the most astounding result is the extraordinary toxicity of the box jellyfish venom which began killing human heart cells virtually on contact and which destroyed 100% of all cells within 10 minutes. Jamie Seymour has long suspected that box jelly venom is both extremely potent and fast acting on humans as well as fish. Now he has the first clinical proof.
10.49.20	While his groundbreaking research into the effects of venom on human cells, is just beginning, there are scientists already exploring venom's potential to cure arthritis, heart disease and cancer.
10.49.32	So these toxins may not always be bad news for human beings.
10.49.38	Who knows, we may one day owe our lives to some of the most dangerous venomous creatures in the world.
10.49.45	END