



# An Examination of Snake and Spider Envenomation and Ethnobiology

**Editor's Note:** This article was submitted by Rodrigo C. G. de Souza and co-authored by Ronaldo de Souza. The views expressed therein are the authors' alone. Rodrigo de Souza is a medical doctor from the Federal University of Minas Gerais, Medical Director of the Hospital Foundation of Itacare, Director of Fauna at the YONIC organisation and head of the Serra Grande Centre for Reproduction in Captivity of Bushmasters (*Lachesis muta*)

The road that leads to what we today call “modern snakebite treatment” is littered with myths, folklore and well intended treatments created more out of desperation and compassion than reason and knowledge. Myths and folklore tend to fade away with scientific advance, although modern research in areas such as ethnobiology are learning to separate wheat from chaff, examining folk knowledge with both an open mind and critical thinking.

At some point in history, each treatment was believed to be effective and beneficial to the patient, until it had to face the crossroads the evolution of science always creates as new evidence gathers: prove itself or clear the way for new approaches. This was the fate of the tourniquet, suction of the venom with the mouth, making cuts across the wounded area, application of ice and many others. Each of these methods faced the crossroads and all took the wrong turn into oblivion.

Today, the slow gathering of *in loco* observations and new theoretical insights suggest that a common treatment taught in all medical schools and common practice in virtually all emergency hospitals might be facing its crossroads:



*L. muta* © Tim Knight



Snakebite travel kit © Dr. J. J. Wijnker

the invasive management of wounds created by snake and spider envenomation.

A growing body of evidence seems to suggest that necrosis in snake and spider envenomation, especially when the necrosis is long lasting, is the result of the body's own defensive system attacking and destroying itself as a reaction to damage directly caused by toxins.



*Phoneutria* spp. © Stephan B.

The body reacts to damage by activating healing and cleanup systems along with the immune system. It seems that this first attempt to clean and heal is conservative or, in other words, it is not in itself damaging. If this first step doesn't work, the second step will be to bring in the immune system's "big guns": the delayed type hypersensitivity response (tumor necrosis factor, gamma interferon, activated macrophages, oxygen radicals, etc.).

In theory, this response could be also activated by aggressive wound management, resulting in a double whammy attack to the body, which may result in a catastrophic necrosis in which the immune system will destroy large amounts of tissue along with whatever pathogen it is fighting against. Since infection is such a common intercurrent in these cases, this auto-immune reaction may easily be misinterpreted as an infection when none exists, or may be overshadowed by a real infection.



Snakebite travel kit © Dr. J. J. Wijnker

## Top Ten Deadliest Snakes in the World

1. **Fierce Snake or Inland Taipan** (*Oxyuranus microlepidotus*) - Australia
2. **Australian Brown Snake** (*Pseudonaja textilis*) - Australia
3. **Malayan Krait** (*Bungarus candidus*) - Southeast Asia and Indonesia
4. **Taipan** (*Oxyuranus scutellatus*) - Australia
5. **Tiger Snake** (*Notechis scutatus*) - Australia
6. **Beaked Sea Snake** (*Enhydrina schistosa*) - South Asian waters, Arabian sea
7. **Saw Scaled Viper** (*Echis carinatus*) - Middle to Eastern Asia
8. **Coral Snake** (*Micrurus fulvius*) - North America
9. **Boomslang** (*Dispholidus typus*) - Africa
10. **Death Adder** (*Acanthopis antarcticus*) - Australia and New Guinea

