

Snake venoms have not revealed all their secrets

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Coelognathus radiata, a slightly venomous colubrid snake from the tropical forests of Asia. Credit: Freek Vonk

For several decades, snake venoms have been used in pharmacology to make new drugs. But a French team of pharmacologists, clinicians, systematists and conservation biologists, headed by Nicolas Vidal of the Laboratory “Systématique, Adaptation, Evolution,” have shown that such venoms are largely under-exploited. They decided to pool their efforts to make full use of these resources in pharmaceutical compounds and to safeguard threatened species. The results of this study are published this week in the journal *Bioessays*.

At present, over 3000 species of snake live on Earth, where they occupy varied ecological niches. Most of them (around 2700) emerged and diversified after the K-T boundary and extinction of the dinosaurs 65 million years ago. This superfamily, known as Xenophidia (Caenophidia), includes the most advanced snakes, characterized by their venomous nature. Among these, snakes with venomous fangs, such as cobras, vipers and rattlesnakes, make up around 600 species. The remaining species, some 2000, are known as “Colubridae” or “colubrid snakes”. Since they do not have venomous fangs at the front of the mouth, they are generally harmless to humans. As they were thought to have no venom, they were neglected for many years. Recent discoveries in snake systematics have shown that, due to this taxonomic bias, certain species have been underexploited, although they could have proved medically useful .

Only over the last few years have scientists begun to take an interest in these usually harmless snake venoms. In this study, the scientists reviewed recent progress and looked at new technologies, such as High Throughput Screening, which could make it possible to identify and extract therapeutically useful molecules both quickly and efficiently. Snake venoms are also thought to be unexpectedly varied as their composition can differ, even among individuals from the same litter.

At the same time, a major biodiversity crisis is seriously threatening the [snake](#) populations on which these biomedical hopes are based. For this reason, systematists, conservation biologists, pharmacologists and clinicians need to join forces to preserve the biodiversity of these colubrid snakes, as much for their role in maintaining ecosystems as for their chemical diversity and the medical potential that they represent.

More information: Freek J. Vonk, et al. "Snake venom: From fieldwork to the clinic". *Bioessays*, [DOI:10.1002/bies.201000117](https://doi.org/10.1002/bies.201000117) , March 2011

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