



## Poisonous Snakes Reported in Sri Lanka in Past 10 Years : A Systematic Review

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### INTRODUCTION

Snakebite is a health dispute precise to some parts of the world, particularly in the tropical areas, where it produces many victims. It has been valued that five million snake bite cases occur worldwide every year, causing about 100,000 deaths. Snake bite is entirely accidental in nature. Snake bite is significant and serious problem in many parts of the world, especially in South Asian countries.

### ABSTRACT

**Background:** Snake bites are an important public health problem in developing countries with most bites occurring in rural areas. Severe envenomation often occurs in children and following bites to the face. Prompt administration of potent anti-venom remains the mainstay of management. However, in Sri Lanka, the use of anti-venoms is limited by non-availability, high cost (where available) and poor mastery of treatment guidelines.

**Methodology:** Research Type: Systematic Review from data researching from PubMed and grouping data and reverted conclusion. In search data as poisonous snakes in Sri Lanka, snake bite case study in Sri Lanka and cases death by snake venom in Sri Lanka in 10 years of duration 2009 to 2019. List out the snakes according to the collected data and identify the snakes with pictures in schedule as reported cases.

**Results:** Poisonous Snakes in Sri Lanka by collection of the indexed journal article revealed as; Russell's vipers (*Daboia russelii*) *Naja naja*, *Bungarus caeruleus*,

hump-nosed pit vipers (*Hypnale hypnale*), *Echis carinatus*, *Hypnale zara*, *Hypnale nepa* and Sri Lankan green pit viper (*Trimeresurus trionocephalus*) were got from this result.

**Conclusion:** Total 08 snakes bite reported in Sri Lanka very common and deadly or hospital reported cases of victims from venomous snakes past 10 years of period. Many cases identified in rural area and urban bear land was scene of victim attacked by snakes. Therefore, in this research output was only 08 dangerous snakes were reported as endangered of life of victims in Sri Lanka.

The author Vipul Namdeorao Ambade *et al.* (2011) stated that, In Sri Lanka, there are about 200 species of snake, of which only five are deadly, namely cobra, krait, Russell's viper, saw-scaled viper and hump nose pit viper. According to local epidemiology, annual snakebite incidence in Sri Lanka is about 400 per 100,000 people, corresponding to 80, 000 snakebites in a 20 million populations in 2018 by scientific and medical reports.<sup>1</sup>

In Sri Lanka, only a small portion of the region contains snakes or vipers in its fauna. Bites generally occur accidentally, on the foot or ankle as a result of stepping on the snake, or the hand if the person picks up the snake. The chief clinical injury caused by snakebites includes a toxic response that is recognized to be haemotoxic, neurotoxic and myotoxic. It has also been conventional that the significance and magnitude of neurological impairment varies according to specific factors and is related to organ dysfunction, shock or hypotension. Although most of the local responses are considered innocent, the haematological inferences might be fatal due to pro-haemorrhagic responses. Systemic haemorrhage and coagulopathy are rare phenomena in humans, because there is a small amount of venom spread to a large body mass of the victim. Haematological irregularities include neutrophil leucocytosis, thrombocytopenia, anaemia, elevation of serum creatine phosphokinase, and metabolic acidosis<sup>2</sup>. In the interim, compartment syndrome afterward snakebite is considered to be fairly rare, but has been stated involving the hand or forearm subsequent envenomation<sup>3</sup>. The emergency management may necessitate surgical treatment, in order to save the nerves and soft tissues. Deprived of intervention, venous and lymphatic drainage of the injured area will be negotiated and secondary, the local arterioles will show induced tissue ischaemia and additional lesions. Classically, there are measured 5 envenomation grades,

ranging from 0 to 4. the severity of local reactions reliant on the degree of envenomation as follows: grade 0 involves only swelling and erythema around the bite marks of less than 2.5 cm (no envenomation), grade 1 is considered when swelling and erythema are between 2.5 and 15 cm without clinical signs, grade 2 indicates swelling and erythema of 15 to 40 cm with only mild systemic signs, in grade 3 there is swelling and erythema over 40 cm with systemic signs, and grade 4 includes coma, shock, and severe systemic signs<sup>4</sup>. This research's objectives are, to identify the most venomous snakes reported as deadly bite in Sri Lanka and to create awareness on that particular snakes to be aware from our promises and identification of the venomous snakes in urban and rural areas of Sri Lanka.

## MATERIALS AND METHODS

Research Type: Systematic Review. Reviewed from data researching from PubMed and grouping data and reverted conclusion. In search data as poisonous snakes in Sri Lanka, snake bite case study in Sri Lanka and cases death by snake venom in Sri Lanka in 10 years of duration 2009 to 2019. List out the snakes according to the collected data and identify the snakes with pictures in schedule as reported cases. Grouping the collected data with snake names, title of the paper and citation with PubMed references.a





## RESULTS

**Table 1:** Poisonous snakes in collected data

No.	Poisonous Snake	Title of the paper	Citation
1.	Russell's vipers ( <i>Daboia russelii</i> ) <i>Naja naja</i> , <i>Bungarus caeruleus</i> , and hump-nosed pit vipers ( <i>Hypnale hypnale</i> )	Syndromic approach to treatment of snake bite in Sri Lanka based on results of a prospective national hospital-based survey of patients envenomed by identified snakes.	Ariaratnam CA, Sheriff MH, Arambepola C, Theakston RD, Warrell DA., Am J Trop Med Hyg. 2009 Oct;81(4):725-31. doi: 10.4269/ajtmh.2009.09-0225. DOI: 10.4269/ajtmh.2009.09-0225 PMID: 19815895 [Indexed for MEDLINE]
2.	Russell's vipers ( <i>Daboia russelii</i> )	Victims' response to snakebite and socio-epidemiological factors of 1018 snakebites in a tertiary care hospital in Sri Lanka.	Kularatne AM(1), Silva A(2), Maduwage K(3), Ratnayake I(4), Walathara C(5), Ratnayake C(1), Mendis S(5), Parangama R(5), Wilderness Environ Med. 2014 Mar;25(1):35-40. doi: 10.1016/j.wem.2013.10.009. Epub 2014 Jan 10.
3.	<i>D. russelii</i> , <i>N. naja</i> , <i>E. carinatus</i> and <i>B. caeruleus</i> .	Efficacy of Indian polyvalent snake antivenoms against Sri Lankan snake venoms: lethality studies or clinically focussed in vitro studies.	Maduwage K(1)(2), Silva A(3)(4), O'Leary MA(1), Hodgson WC(3), Isbister GK(1)(2). Sci Rep. 2016 May 27;6:26778. doi: 10.1038/srep26778. PMCID: PMC4882578, PMID: 27231196

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|-----|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.  | <i>Hypnale hypnale</i> , <i>Hypnale zara</i> and <i>Hypnale nepa</i> | Coagulopathy, acute kidney injury and death following <i>Hypnale zara</i> envenoming: the first case report from Sri Lanka.                                       | Maduwage K(1), Kularatne K, Wazil A, Gawarammana I. <i>Toxicon</i> . 2011 Dec 1;58(8):641-3. doi: 10.1016/j.toxicon.2011.09.014. Epub 2011 Sep 28.                                                                                                                                                                          |
| 5.  | The Indian krait ( <i>Bungarus caeruleus</i> )                       | Venomics of <i>Bungarus caeruleus</i> (Indian krait): Comparable venom profiles, variable immune reactivities among specimens from Sri Lanka, India and Pakistan. | Oh AMF(1), Tan CH(2), Ariarane GC(3), Quraishi N(4), Tan NH(5). <i>J Proteomics</i> . 2017 Jul 5;164:1-18. doi: 10.1016/j.jprot.2017.04.018. Epub 2017 May 2. PMID: 28476572                                                                                                                                                |
| 6.  | The Indian krait ( <i>Bungarus caeruleus</i> )                       | Medico-legal significance of the identification of offending snake in a fatal snake bite: a case report.                                                          | Silva A(1), Gamlaksha D, Waidyaratne D. <i>J Forensic Leg Med</i> . 2013 Nov;20(8):965-7. doi: 10.1016/j.jflm.2013.09.009. Epub 2013 Sep 22. PMID: 24237800                                                                                                                                                                 |
| 7.  | <i>H. hypnale</i> , <i>H. nepa</i> and <i>H. zara</i>                | Comparative in-vivo toxicity of venoms from South Asian hump-nosed pit vipers (Viperidae: Crotalinae: <i>Hypnale</i> ).                                           | Silva A(1), Gunawardena P, Weilgama D, Maduwage K, Gawarammana I. <i>BMC Res Notes</i> . 2012 Aug 29;5:471. doi: 10.1186/1756-0500-5-471. PMCID: PMC3494509 PMID: 22932058                                                                                                                                                  |
| 8.  | Sri Lankan green pit viper ( <i>Trimeresurus trigonocephalus</i> )   | Sri Lankan green pit viper ( <i>Trimeresurus trigonocephalus</i> ) bites in Deniyaya: A clinico-epidemiological study.                                            | Witharana EWRA(1), Gnanathan A(2), Dissanayake AS(3), Wijesinghe SKJ(4), Kadahetti SCL(4), Rajapaksha RMJK(4). <i>Toxicon</i> . 2019 Nov;169:34-37. doi: 10.1016/j.toxicon.2019.07.011. Epub 2019 Jul 23. PMID: 31348933                                                                                                    |
| 9.  | Russell's viper, <i>Vipera russelli</i>                              | Snake venoms in science and clinical medicine. Russell's viper: biology, venom and treatment of bites.                                                            | Warrell DA(1)., <i>Trans R Soc Trop Med Hyg</i> . 1989 Nov-Dec;83(6):732-40. doi: 10.1016/0035-9203(89)90311-8. PMID: 2533418                                                                                                                                                                                               |
| 10. | Russell's viper ( <i>Daboia russelii</i> )                           | A randomized controlled trial of fresh frozen plasma for coagulopathy in Russell's viper ( <i>Daboia russelii</i> ) envenoming.                                   | Isbister GK(1)(2), Jayamanne S(2)(3), Mohamed F(2), Dawson AH(2)(4), Maduwage K(1)(2)(5), Gawarammana I(2)(6), Lalloo DG(7), de Silva HJ(2)(3), Scorgie FE(8), Lincz LF(8), Buckley NA(2)(4). <i>J Thromb Haemost</i> . 2017 Apr;15(4):645-654. doi: 10.1111/jth.13628. Epub 2017 Feb 16. PMCID: PMC5408386, PMID: 28106331 |

**Table 2:** Reported Poisonous Snakes in Sri Lanka

No.	Poisonous Snake	Image of snake
1.	Russell's vipers ( <i>Daboia russelii</i> )	
2.	Saw scaled viper ( <i>Echis carinatus</i> )	
3.	Cobra ( <i>Naja naja</i> )	
4.	hump-nosed pit vipers ( <i>Hypnale hypnale</i> )	
5.	The Indian krait ( <i>Bungarus caeruleus</i> )	
6.	<i>Hypnale zara</i>	
7.	<i>Hypnale nepa</i>	
8.	Sri Lankan green pit viper ( <i>Trimeresurus trigonocephalus</i> )	

**DISCUSSION**

According to the result of this research, this Systematic Review from data researching from PubMed and grouping data. In search data as poisonous snakes in Sri Lanka, snake bite case study in Sri Lanka and cases death by snake venom in Sri Lanka in 10 years of duration 2009 to 2019. List out the snakes according to the collected data and identify the snakes with pictures in schedule as reported cases. Poisonous Snakes in Sri Lanka by collection of the indexed journal article revealed as; Russell's vipers (*Daboia russelii*) *Naja naja*, *Bungarus caeruleus*, hump-nosed pit vipers (*Hypnale hypnale*), *Echis carinatus*, *Hypnale zara*, *Hypnale nepa* and Sri

Lankan green pit viper (*Trimeresurus trigonocephalus*) were got from this result. Total 08 snakes bite reported in Sri Lanka very common and deadly or hospital reported cases of victims from venomous snakes past 10 years of period. The most cases reported by Russell's vipers (*Daboia russelii*) snake bite then reported by *Bungarus caeruleus*, and minimize reported by other snakes such as; *Naja naja*, hump-nosed pit vipers (*Hypnale hypnale*), etc. case reports, Comparable venom profiles, variable immune-reactivities among specimens, Medico-legal significance of the identification of offending snake in a fatal snake bite: a case report, Comparative in-vivo toxicity of venoms from South Asian hump-nosed pit vipers, A clinico-epidemiological study and Snake venoms in science and clinical medicine. Russell's viper: biology, venom and treatment of bites were discussed in every indexed journal articles which were used in this review. Many cases identified in rural area and urban bear land was scene of victim attacked by snakes. Therefore, in this research output was only 08 dangerous snakes were reported as endangered of life of victims in Sri Lanka.

**CONCLUSION**

Russell's vipers (*Daboia russelii*) *Naja naja*, *Bungarus caeruleus*, hump-nosed pit vipers (*Hypnale hypnale*), *E. carinatus*, *Hypnale zara*, *Hypnale nepa* and Sri Lankan green pit viper (*Trimeresurus trigonocephalus*) were 08 snakes reported cases in urban area of victims in Sri Lanka.

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