

# How Venomous Is Highly Venomous?

## THE MEDICALLY IMPORTANT SNAKES IN SRI LANKA

Most land snakes are non-venomous; some snakes are very venomous, a bite resulting in considerable morbidity and even mortality; and some, in between. In Sri Lanka we have, in the past, followed the practice of classifying snakes

as **highly venomous**, **moderately venomous** and **mildly venomous** (or **non-venomous**) based on whether envenoming by such a snake could cause morbidity requiring treatment.

This article refers only to land snakes.

### Historical Categories of venomous snakes

Highly venomous —	causing life-threatening envenoming
Moderately venomous —	causing morbidity requiring treatment but unlikely to be life-threatening
Mildly venomous —	causing envenoming, but not requiring specific treatment

The currently used term **medically important snakes** is a refinement that follows a World Health Organisation (WHO) publication that classified snakes into two categories as follows (WHO, 2010):

**CATEGORY 1: Highest Medical Importance** - highly venomous snakes that are common or widespread and cause numerous snakebites, resulting in high levels of morbidity, disability or mortality.

**CATEGORY 2: Secondary Medical Importance** - highly venomous snakes capable of causing morbidity, disability or death, but for which (a) exact epidemiological or clinical data are lacking or (b) are less frequently implicated because of their behaviour, habitat preferences or occurrence in areas remote from large human populations.

Based on the definition given above the WHO Guidelines of 2016 placed the medically important snakes in Sri Lanka in the two categories thus:

Category 1: **Elapidae:** *Bungarus caeruleus* & *Naja naja*;  
**Viperidae:** *Daboia russelli* & *Hypnale hypnale*.

Category 2: **Elapidae:** *Bungarus ceylonicus*;  
**Viperidae:** *Echis carinatus*, *Hypnale nepa*, *Hypnale walli* and *Trimeresurus trigonocephalus* (= *Craspedocephalus trigonocephalus*).

(Editor's note: *H. walli* is considered a junior synonym of *H. nepa* - Maduwage et al, 2009)

Recent reports highlight other, rarely encountered species, whose bites need to be taken seriously. A 2011 publication reports a death following a bite by *Hypnale zara* (Maduwage et al, 2011). The three species of *Hypnale*—*hypnale*, *nepa* and *zara*—have hitherto been lumped together in the absence of reports of envenoming irrefutably ascribed to a species other than the widely distributed *H. hypnale*. In this publication, we recognise the place of *H. zara* as a snake of medical importance. Bites by *H. nepa*—a snake confined to the central hills—have been reported recently (Rathnayake et al, 2017a). In a series of 152 patients admitted to the Provincial General Hospital Ratnapura following proven hump-nosed pit viper bites over a 21-month period, 8 (5.26%) were bites by *H. nepa*, 22 (14.47%) by *H. zara* and 122 (80.26%) by *H. hypnale*. The manifestations of envenoming caused by the three species were similar, the authors remarking that larger series were needed to verify whether any differences existed.

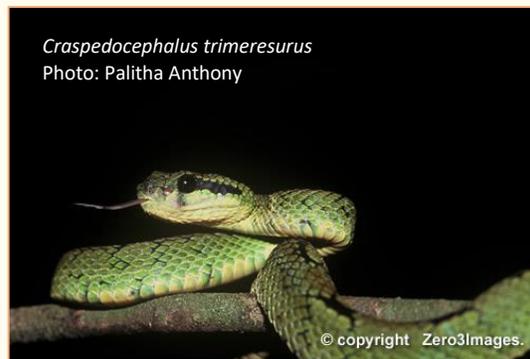
A 2015 paper (Fernando et al, 2015) reports a bite by the rarely seen forest dwelling colubrid, the Sri Lankan keelback or blossom krait (*Rhabdophis ceylonensis*), that bit its



Considering the data detailed above, a classification of practical relevance to clinicians in Sri Lanka was proposed in the 2017 guidelines (Table 1). This classification uses “reported fatalities” as one of the criteria on which the level of importance is based. It has been pointed out that this is not a good criterion as fatalities

handler in the course of a bio-diversity survey causing systemic envenoming that needed treatment. The authors remark “We conclude that *B. ceylonensis* (now *R. ceylonensis*) should be regarded as a medically significant venomous snake.”

*Craspedocephalus trigonocephalus* (formally *Trimeresurus trigonocephalus*), the Green pit-viper, has been known to be venomous and has hitherto been listed as a moderately venomous snake causing severe local envenoming (Rathnayake, 2013), rarely, systemic envenoming with spontaneous resolution over days (Kularatne & Pathirage, 2005). Three case studies published in 2017 (Rathnayake et al, 2017b) confirm that they are capable of causing systemic envenoming to a potentially life-threatening degree. The bite victims developed coagulopathy that was treated with fresh frozen plasma. The authors remark that “these three cases prove potential life-threatening hazard ...” and that clinicians should be aware of and be warned against using the polyvalent antivenom available in hospitals. They also remark that the general public should not be unnecessarily alarmed by labelling the snake as ‘highly venomous’ to prevent pointless killing.



may not be reported for reasons other than the degree of venom potency of the snake in question e.g., delays in treatment-seeking, delays in treatment, harmful first aid, etc. (pers. comm. Anjana Silva). Despite this drawback, this criterion is retained in keeping with the policy of basing guideline recommendations on published

data rather than personal opinion, wherever possible.

**Table 1: Classification of Snakes of Medical Importance in Sri Lanka**

	Scientific name: English common name	Level of importance
<i>Envenoming is possibly life-threatening with reported fatalities</i>		
1.	<i>Naja naja</i> : Cobra	Highly venomous
2.	<i>Bungarus caeruleus</i> : Common krait	Highly venomous
3.	<i>Bungarus ceylonicus</i> : Sri Lankan krait	Highly venomous
4.	<i>Daboia russelii</i> : Russell's viper	Highly venomous
5.	<i>Hypnale hypnale</i> : Merrem's hump-nosed pit-viper	Highly venomous
6.	<i>Hypnale zara</i> : Lowland hump-nosed pit-viper	Highly venomous
<i>Envenoming is potentially life-threatening, with no reported fatalities</i>		
7.	<i>Hypnale nepa</i> : Sri Lankan hump-nosed pit-viper	Potentially highly venomous
8.	<i>Craspedocephalus trigonocephalus</i> : Green pit-viper	Potentially highly venomous
<i>Envenoming is not life-threatening, responds to treatment, no reported fatalities</i>		
9.	<i>Echis carinatus</i> : Saw-scaled viper	Venomous*
10.	<i>Rhabdophis ceylonensis</i> : Sri Lankan keelback, Blossom krait	Venomous

\* There is divided opinion on whether *E. carinatus* should be placed in a higher category of medical importance. Its position will remain here until published data proves otherwise.

Table 2 gives a list of snakes of low medical importance that can be considered “mildly venomous”—a term that can be used to allay fears among victims of bites by these species.

**Table 2: List of Snakes of Low Medical Importance in Sri Lanka**

	Scientific name: English common name
1.	<i>Boiga</i> spp. : Cat snakes
2.	<i>Calliophis melanurus sinhaleus</i> : Sri Lankan coral snake
3.	<i>Ahaetulla</i> spp. : Whip snakes, Vine snakes
4.	<i>Cerberus rhynchops rhynchops</i> : Dog-faced water snake
5.	<i>Chrysopelea</i> spp. : Flying snake, Gold and black tree snake



Compiled by Malik Fernando, Editor -  
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