



• A QUICK GUIDE TO SEA SNAKES OF •
SINDHUDURG



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Acknowledgment

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DIVERSITY

The major families of snakes inhabiting coastal ecosystems in south and south east Asia are *Elapidae* (venomous) (sub family: *Laticaudinae* and *Hydrophiinae*), *Acrochordidae* (non-venomous) and *Homalopsidae* (mildly venomous).

The snakes in the *Laticaudinae* subfamily are commonly known as sea kraits and are distributed in the Indian and Pacific oceans. Sea kraits comprise eight species of marine amphibious snakes distributed along the shores of the Western Pacific Ocean and the Eastern Indian Ocean. In India, the two species of sea kraits viz. yellow lipped sea krait (*Laticauda colubrina*) and blue lipped sea krait (*Laticauda laticaudata*) are reported from the Andaman Islands. Sea kraits can be identified by the presence of large ventral scales and strong musculature around the body which help them move easily on land while retaining a paddle shaped tail to swim.

The snakes in the *Hydrophiinae* family are known as true sea snakes and are completely aquatic. *Hydrophiines* are distributed from the Persian Gulf to Australia with the exception of the yellow bellied sea snake (*Hydrophis platurus*) which also occurs in the Pacific Ocean. There are close to 22-25 species of true sea snakes reported from the Indian coast.

Homalopsid snakes range from the Indian subcontinent and continue to occur eastwards across SE Asia to the Philippines, southward into Indonesia, Australia and New Guinea, and Micronesia. They seem to form two major groups. One group is terrestrial and fangless while the more aquatic group has rear-fangs and venom glands. All are viviparous, and have nasal valves which helps in diving as it stays shut thus helping the animal to stay underwater for a longer duration. Some of the aquatic species are restricted

to freshwater, while others exploit coastal environments with a tolerance to salinity. Some of the commonly known species are the dog faced water snake (*Cerberus rynchops*), glossy marsh snake (*Gerarda prevostiana*) and rainbow watersnake (*Enhydryis enhydryis*).

The snake family *Acrochordidae* includes the single genus, *Acrochordus*. All three *Acrochordus* species are fully aquatic snakes and are found in the Indo-Australian region. The three known species have loose-fitting granular scales, hence the common name “file snakes.” *Acrochordus granulatus* is the most widely distributed species, reported from coastal northwest India to the Solomon Islands and occurs in diverse habitats, including freshwater lakes and rivers, mangroves, mudflats, reefs, and open sea.

HABITAT

All sea snakes need to come up to the surface to breath air like other marine vertebrates such as sea turtles and cetaceans. This is aided by a pair of enlarged long lungs. However, some species have also evolved subcutaneous mechanism of respiration.

Although sea snakes live their whole lives in marine water, they depend upon freshwater for survival. Sea kraits actively come onto land to seek sources of freshwater while true sea snakes rely on rainwater or river mouths for their freshwater consumption. Thus, true sea snakes have been observed to go through prolonged durations of dehydration. Most sea snakes dwell in shallow nearshore waters close to estuaries and river mouths.

Sea snakes inhabit a wide range of marine habitats such as rocky shores, sandy shores, inter-tidal habitats, estuaries, coral reefs and are also found up to 10 km inland within rivers. Sea snakes show philopatry (site fidelity) to their natal grounds. Other common water snakes inhabit intertidal, estuarine habitats and sometimes nearshore coastal waters such as the file snake (*Acrochordus granulatus*), dog faced water snake (*Cerberus rynchops*), glossy marsh snake (*Gerarda prevostiana*). These species occasionally get caught as bycatch in fishing nets.



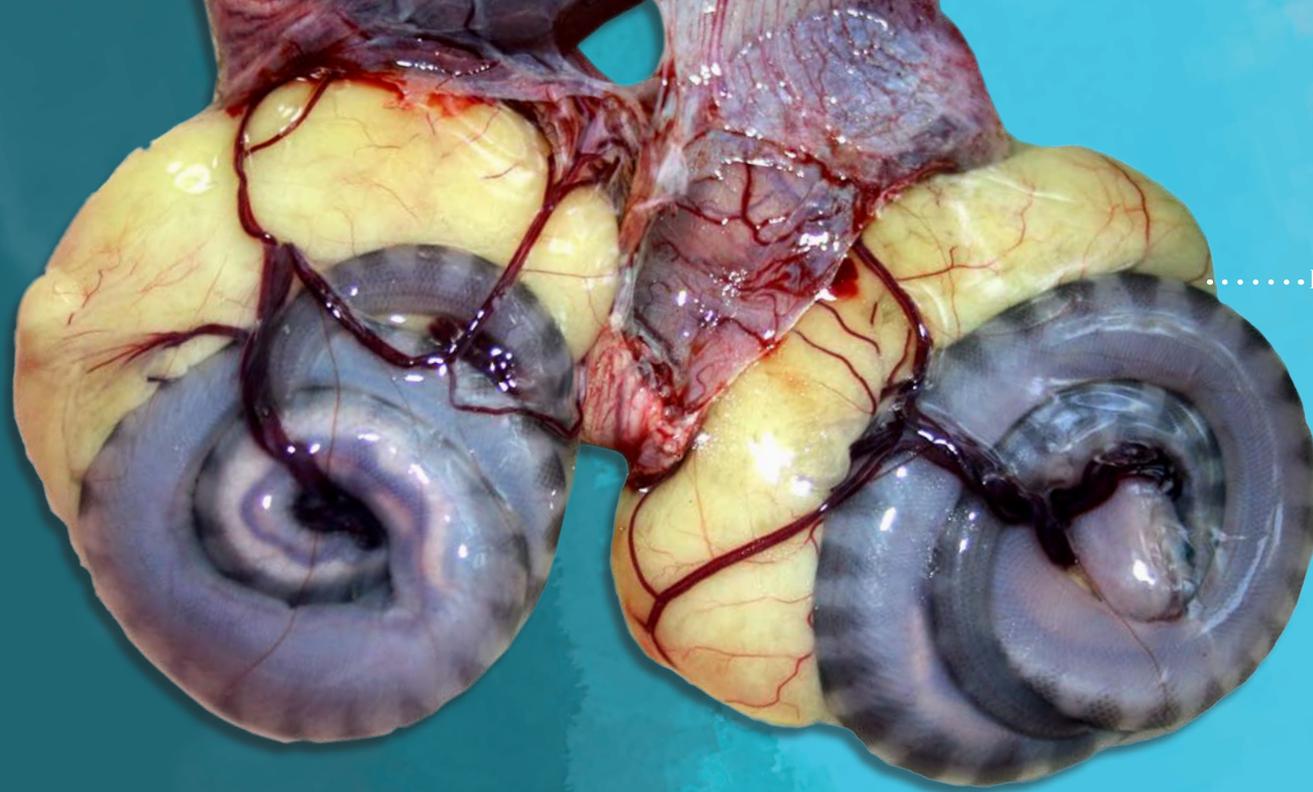
FOOD

Sea snakes are carnivores known to feed on a wide range of prey such as fishes, crustaceans, gastropods and molluscs. Certain species are dietary generalists such as Shaw's sea snake (*Hydrophis curtus*) feed on a range of marine prey from gastropods to fishes whereas species such as the turtle headed sea snake (*Emydocephalus annulatus*) are specialist feeders of fish eggs found in Australia, Papua New Guinea. Sea kraits are known to specialize in hunting giant moray eels. File snakes use constriction to subdue their prey.

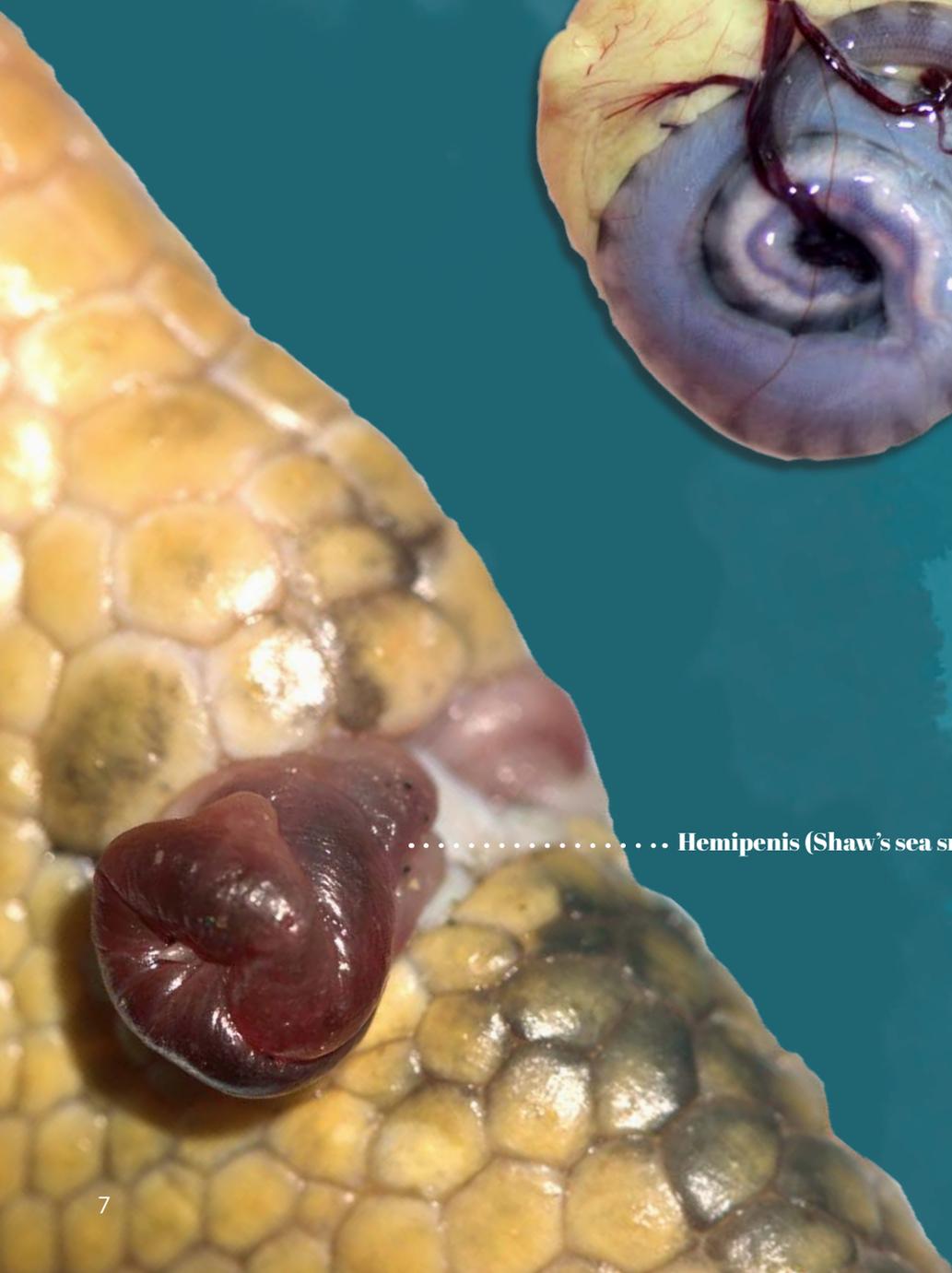
Homalopsid snakes have semi-aquatic or aquatic life styles, while a few are more terrestrial. While semi-aquatic and aquatic species tend to feed on crustaceans and fish, the more terrestrial species feed on frogs and worms.

Sea snakes play an ecologically important role of mid trophic level predators and are important biological control of various marine fauna and aid in maintaining a healthy ecosystem.





..... Embryos of hook nosed snake



..... Hemipenis (Shaw's sea snake)

REPRODUCTION

Mating strategies may vary across species but most species mate underwater. The males and females are tightly coiled around each other and the female often drags the males upto the surface as she comes up for air while mating. The male copulates the female and is unable to disengage until mating is completed.

Hemipenis is the reproductive male organ found in all members of the order *Squamata* which include all modern snakes and lizards. The hemipenis creates a bulge around the tail in males and sometimes helps to identify between sexes. Hemipenis shape and structure is an important taxonomic character and is

often studied to distinguish between different species. Almost all sea snakes, file snakes and *homalopsid* snakes are viviparous (live-bearing) except for sea kraits which are oviparous (egg-laying) and often come onto land to lay eggs.



THREATS

Sea snakes in India are largely threatened by fishing when they get caught as incidental bycatch. Some species have a very low threshold for tolerating the stress of being caught in nets and die in the process. This has resulted in the global decline of some sea snake populations. Sea snakes are not listed by the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES). However, sea snakes are protected in India under schedule IV of the Wildlife Protection Act, 1972. Despite the protection status, very little enforcement to curb mortalities takes place on the ground. Since information on mortalities of sea snakes around the Indian coast is absent, declines (if any) of sea snake populations due to fishing pressures is unknown. Studies elsewhere have shown that sea snakes are indicators of the effects of climate change due to their sensitivity to salinity and freshwater availability.

IDENTIFICATION

A key to identify some of the species of sea snakes occurring in Sindhudurg district, Maharashtra is listed below. These species were encountered during the ongoing sea snake survey.

IDENTIFYING THE GENUS:

Scales on the head are large, smooth, body scales keeled and overlapping, body stout, flat oar shaped tail ***Hydrophis***

Scales on the head are tiny with tubercles/keels/warts, loose skin folds on the body visible, head indistinct from neck, body scales small and close to one another, thin and slender tail ***Acrochordus***

IDENTIFYING THE SPECIES:

Scales on the head are large and smooth, Scale on the tip of the mouth curved, lower jaw shows a divided ridge with a elongated scale present in between, body colour olive green to black with faint bands, tail flat but broad ***Hydrophis schistosus***

Scales in the middle of the head are divided into smaller scales, body colour yellowish with black bands; body scales are larger in the lower half of the body, tail flat but broad ***Hydrophis curtus***

Scales on the head are tiny, granular with warty appearance, tail flat but narrow ***Acrochordus granulatus***



HOOK NOSED SEA SNAKE (DAUDIN, 1802)

IUCN RED LIST CATEGORY: LEAST CONCERN



The scales are keeled, body gray to black with faint stripes



The presence of a long and curved rostral scale (tip of the mouth) gives it a beaked appearance

Hydrophis schistosus

General distribution:

Indo - West Pacific, from the Persian Gulf to Australia.

Distribution in Sindhudurg:

Observed in fishing nets in Devgad, Malvan and Vengurla.

Common names: Beaked sea snake, hook nosed sea snake.

Scale pattern: Mental narrow, elongated and hidden in a groove by chin shields. Scale rows around neck 40–55; scale rows around body 49–66; ventrals small but distinct 26–32, sometimes missing in the most anterior portion of body. Maxillary teeth behind fangs 3–4, head scales have tubercles.

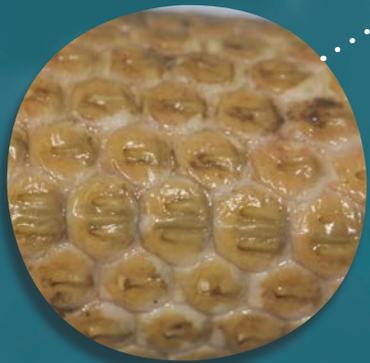
Size: 120-140 cm (body length), abdominal region broader than the upper body.

Coloration: Grey or dark olive dorsally, whitish ventrally; body rings developed in juveniles but paler or absent in adults; exceptionally black dorsally. Juveniles are more distinctly banded while adults are pale to plain coloured.

REMARKS: Venomous. *Hydrophis schistosus* is distinct from other species in the Indian coast due to its beaked-shaped rostral and dagger-shaped mental. Results of our field surveys showed that this is the most abundant species caught in fishing nets. A recent study revealed that this species consists of two convergent or divergent lineages throughout its geographical range. Now, the Australian lineage is elevated to species status and referred as to *H. zweifeli*. Juvenile snakes are more distinctly banded than adults.

SPINE BELLIED SEA SNAKE (SHAW, 1802)

IUCN RED LIST CATEGORY: LEAST CONCERN



The spiked projections on the ventral scales are present only in males. It is an indicator of its breeding season.

Hydrophis curtus

General distribution:

Indo - West Pacific, from the Persian Gulf to Australia.

Distribution in Sindhudurg:

Observed in fishing nets in Devgad, Malvan and Vengurla.

Common names:

Shaw's sea snake, short sea snake, spine-bellied sea snake.



Head and neck indistinguishable and large smooth scales on the head, presence of large nasal valves.

Scalation: Scale rows around neck 23–35; scale rows around body 25–43. Ventrals small, 114–230, usually distinct anteriorly, very small or absent posteriorly. Head large, parietal scales divided into small shields. Spiky projections in the scales are seen in male snakes.

Size: 75-94 cm (body length)

Coloration: Yellowish/sand coloured body with dark brown/black bands. Juveniles more distinctly banded and are more darker in colour than adults.

Remarks: Venomous. *Hydrophis curtus* is one of the most common sea snakes along the Indian coast. However, our results suggest that it shows signs of decline as fewer individuals were caught in Sindhudurg in comparison to *Hydrophis schistosus*. *Hydrophis curtus* is a diet generalist, known to prey on fish belonging to 33 families, cuttlefish and amphipods.

LITTLE WART SNAKE

(SCHNEIDER, 1799)

IUCN RED LIST CATEGORY: Least concern



The skin is loose in appearance and skin folds can be seen throughout the body.



Acrochordus granulatus

General distribution:

Coastal regions from India to Australia.

Distribution in Sindhudurg:

One individual was found from a trawl net in Malvan.

Common names: File Snake, little Wart Snake.

Scalation: Supralabials 8-11; row of small scales separates supralabials from mouth; infralabials 12-18.

Size: 90-120 cm.

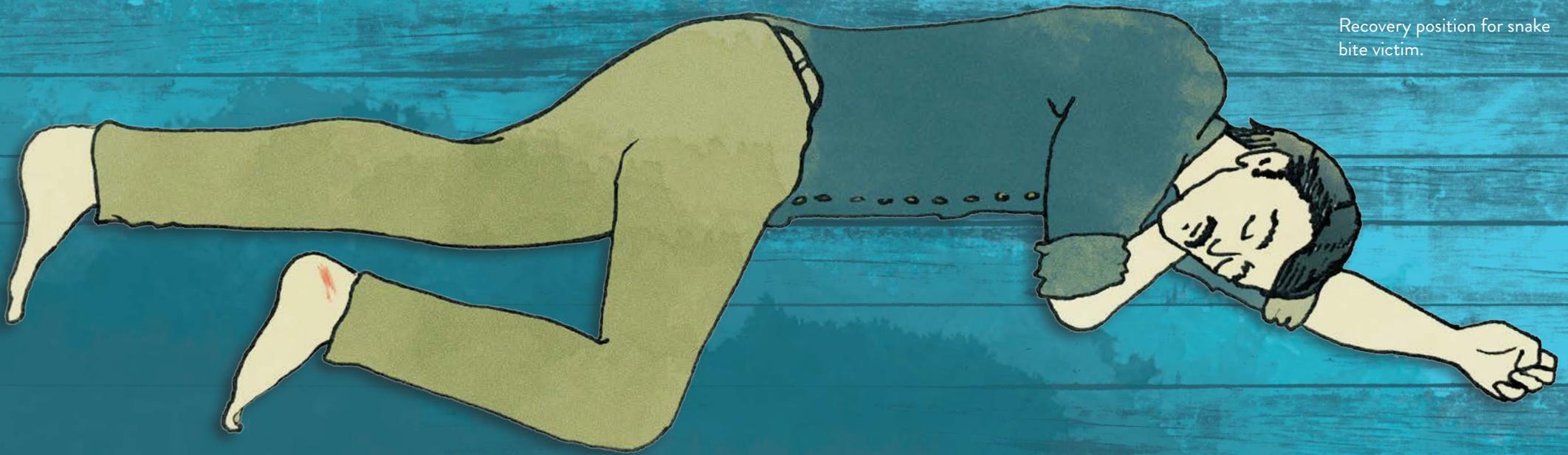
Coloration: Olive, blue or blackish-grey with transverse cream bands, best marked in juveniles and pale in adults.

Remarks: Non venomous. *Acrochordus granulatus*, also known as the little file snake is not a sea snake, and reaches a maximum length of about 1 m, while the other two known species of file snakes may be between 1.7-2.0 m long. *Acrochordus granulatus* has a prominent central skin fold, and a laterally compressed tail. Since it lacks venom, file snakes are known to constrict their prey instead. They are found in freshwater habitats, estuaries and in the open sea, up to 10 km offshore and at depths of 20 m.



Scales are tiny and granular and large nasal valves are present.

SNAKE BITE



Recovery position for snake bite victim.

Check for bite signs/symptoms

- The bite of sea snakes (Hydrophiinae) and sea kraits (Laticaudinae) is usually painless and may not be noticed by the victim. Fangs and other teeth may be left in the wound. In some cases, snakes bite but do not inject venom. This is known as dry bite. Keep the person calm and monitor his/her health and check for symptoms.
- It is important to stay calm

and breath normally. Anxious people may over-breathe and develop symptoms and signs such as dizziness, stiffness of hands, increase in blood pressure etc. even when no venom has been injected. This may lead to complications.

- On signs of envenomation, immediate medical attention is required. Prepare to take the victim to the nearest hospital/medical centre IMMEDIATELY. Although particular antivenin is not available for sea snakes in India, prompt and proper medical care can save a patient from complications due to infection and secondary conditions.

DIATELY. Although particular antivenin is not available for sea snakes in India, prompt and proper medical care can save a patient from complications due to infection and secondary conditions.

- In case if medical help is far away, the following first aid method should be followed while transporting the patient to the hospital.

Pressure-immobilisation method using pressure pads and bandages:

- Ideally, an elastic bandage approximately 10–15 cm wide and at least 4.5 metres long should be used. If that is not available, any long strips of clothing material can be used.
- The bandage is bound firmly

ly but not tightly around the entire bitten limb, starting around the fingers or toes and moving upwards. Care should be taken that the patient does not develop any severe pain in the limb.

- A rubber and/or folded material pad approximately 5 sq.cm and 2-3 cm thick can be placed directly over the bite site anywhere on the body and bound in place with

a long strip of non-elastic bandage.

- If the person is breathing adequately, place the person in a recovery position.

PLEASE NOTE :

The methods listed above are only to slow down blood flow and reduce spread of venom. It is in no way an alternative to thorough and proper medical attention.

FURTHER READING

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For more details on snakebite management:

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