

## THE SAW-SCALED VIPER (*ECHIS CARINATUS*)

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Between the ages of about seven and ten, my favourite story was Rudyard Kipling's 'Rikki-Tikki-Tavi'. It contributed towards a lasting interest in tropical reptiles and left me with a misconception about the "Karait, the dusty brown snakeling that lies for choice on the dusty earth; and his bite is as dangerous as the cobra's. Bue he is so small that nobody thinks of him, and so he does the more harm to people". For some years afterwards, I visualized a Krait as some kind of venomous *Typhlops*, for Kipling had confused the Krait (*Bungarus caeruleus*) with the Saw-Scaled, or Carpet Viper (*Echis carinatus*). Even his description of the latter is somewhat misleading because *E. carinatus* is a typical stocky viper, reaching the length of up to nearly one metre – quite a hefty 'snakeling', though nothing like the size of a Puff Adder or Gaboon Viper.

The Saw-Scaled Viper is a desert species ranging from the Sahara southwards into equatorial Africa and eastwards through central Asia to India and Sri Lanka. (The specimen illustrated here was photographed in the Wahiba Sands, Oman). The various populations of *E. carinatus* differ in size and behaviour.

Most Carpet Vipers are excellent sidewinders. Although they can travel in other ways, such as by undulatory and concertina movements, sidewinding is the most efficient over a smooth, sandy surface. It may also help to avoid overheating when the snake is in the open, because the loops of the body are raised slightly above the heated ground.

When disturbed, these vicious snakes inflate their bodies, form themselves into open horseshoe-shaped coils, and rub the oblique lateral saw-toothed scales against one another. The vibration produces a hissing sound like violently boiling water. The Sand Viper (*Cerastes vipera*), the Horned Viper (*C. cerastes*), as well as Egg Eating Snakes (*Dasypeltinae*) are said to do the same. (Although the latter are harmless, they have a marked resemblance to the dangerously



Plate 1. *E. carinatus* showing the marks of its coiling in the sand.

poisonous Saw-Scaled Viper). It is believed that this method of sound production is an adaptation that reduces water loss in arid environments.

The venom of *E. carinatus* has a high toxicity, with an L.D.50 (ug/g mouse) of 0.44 - 4.80 (intravenous) and 6.55 (subcutaneous). It destroys the tissues rapidly, and is said to be extremely painful. It is not surprising, therefore, that the Saw-Scaled Viper should be mimicked by harmless species such as Egg-Eating Snakes, some back-fanged bush snakes (*Boiga* spp.), and possibly by the gecko *Teratolepis fasciata* in Pakistan.

The colour pattern of *E. carinatus* has multiple functions. Initially it is cryptic, as Kipling pointed out but, after the snake has been annoyed and begins coiling round itself and hissing, its colours become aposematic and have a warning function. The light coloured lines that cross the back are outlined by black scales. These, and the pale dorsal blotches, render the Saw-Scaled Viper more conspicuous than are vipers with unicoloured dark patches on a light background; while inflation of the body emphasises the contrast of the cross bands. Not only is *E. carinatus* a model for several batesian mimics but, at the same time, there is müllerian mimicry with *Cerastes* spp. In fact, both genera are mimicked by *Dasypeltis* spp. in eastern Africa where the latter have patterns of elongated saddles and dark heads without markings.

Of all the sounds emitted by reptiles, the most characteristic one is the hiss. Turtles, tortoises, crocodiles, alligators, monitor lizards, chameleons and snakes, both venomous and non-poisonous, make hissing noises in defence. The term 'deimatic' is used to include all non-specific intimidating displays, postures and frightening noises which may be produced by both harmless and harmful animal species. But whether the hiss of a harmless snake is mimetic or deimatic is debatable. In my opinion, it is probably more often the latter than the former. A loud hiss is a vicious and frightening sound and may be quite sufficient to deter without any investigation as to its cause!