

THE PUFF ADDER (*BITIS ARIETANS*)

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The Puff Adder (*Bitis arietans*) is one of the largest of the African vipers and probably the species most frequently seen by travellers in that continent. It receives its English name from the habit of inflating its body and hissing loudly when disturbed. The sound is produced both when the breath is inhaled as well as during exhalation. This behaviour is characteristic of all true vipers, but is particularly evident in the case of the Puff Adder.

Unlike the Gaboon Viper (*Bitis gabonica*), which is a forest snake, the Puff Adder inhabits subdeserts and savannas, and is also to be found in mountainous regions. Except in rain forests, Puff Adders are widespread southward to the Cape from Morocco in the west and the Sudan in the east. They occur as near to Khartoum as Jebel Aulia. This is their northernmost limit in Sudan, but they range also into western and southern Arabia.

Puff Adders may exceed 1.4m in length, and have a girth of 25cm. Although they do not attain the weight of a full-grown Gaboon Viper they are, nevertheless, formidable snakes.

There may be considerable variation in the coloration of Puff Adders. In some specimens, the chevrons are sooty black and the crescents cream coloured while, in others, the chevrons are dark brown or grey and the crescents dull buff. The blotched pattern of dark chevrons separated by yellow crescents (Plate 1) is cryptic. This, coupled with a lethargic disposition and reluctance to move when disturbed, probably accounts for the comparatively large number of people who get bitten through inadvertently treading on Puff Adders. Although an average of 130mg dried venom are yielded, up to 750mg have been extracted from a single snake. This must be compared with averages of 200mg per snake from Russell's Viper *Vipera russelli* and only 10mg from the common European Adder (*Vipera berus*).



Plate 1. A dull coloured Puff Adder, possibly due to moulting. (Photographed at Nimuli, southern Sudan, December 1961).



Plate II. The fangs of a Puff Adder from Jebel Aulia. (Photographed in the Reptiliary of the Sudan Natural History Museum, Khartoum, December 1981).

The LD50 (ug/g mouse) is 2.00 when injected intravenously, and 7.75 when administered subcutaneously. These figures compare with 0.08 and 4.75 for the venom of Russell's Viper; and 0.55 and 6.45 for that of the Common Adder. The Puff Adder, nevertheless, is among those species of poisonous snake that are chiefly responsible for human deaths in Africa. At the same time, it should be remembered that, of the hundreds of people bitten annually by Puff Adders, the majority are treated only by tribal witch doctors, and most of them recover.

Although the venom of Puff Adders lacks the neurological components found in the poison of the Gaboon Viper, their bites are followed by severe pain and swelling of the tissues in the neighbourhood of the injury. The blood vessels are usually also damaged, and blood stained serum may ooze from the fang marks. Large areas of flesh become gangrenous and, if the victim does not die, are later sloughed away. The necrotizing effect of the venom of the Puff Adder was known to the Greeks and Romans over 2000 years ago. This species was probably the one called 'Spectaficus' – the snake whose bite was reputed to consume the entire body with swelling and putrefaction!

According to Egyptian mythology, the first snake bite must have pre-dated creation because, while Ra the sun god was still making the earth, he stepped on a snake which had been sent by the goddess Isis. The symptoms that he experienced, as listed in the Ebers Papyrus (c 1700 B.C.), suggest that the venom was neurotoxic, and therefore probably that of the Egyptian Cobra (*Naja haje*).

Legends about snakes are widespread throughout Africa. Not surprisingly, most cults centre around pythons (*Python sebae* etc.). Smaller snakes are seldom identified although, in Senegal, according to A. Villiers, the Puff Adder is believed to carry a ball of grease, with magic properties, at the base of its tail. The Wolof believe that snakes of this species have a particular aversion to human faeces. They are said to leap over ten houses to avoid contact with it.

If it is touched with a stick that has been smeared with excrement, the Puff Adder becomes so enraged that it will pursue its tormentor for hours. Even if he flees on horseback or in a motor car, the snake will eventually catch him and strike him to death!

The poison fangs of vipers are large. Unlike those of cobras, they are attached to moveable bones so that they fold backwards when the jaws are closed. The fangs of the Puff Adder are relatively huge (Plate II). They are partly retracted during the process of engulfing food. The palatine teeth are lowered and the large triangular head is forced over the prey by alternating movements of the two sides of the upper jaw.

Puff Adders inhabit dry and sub-arid environments, hiding in half-burned grass during the day, or actually burying themselves in the sand. Their prey consists chiefly of small mammals which are hunted mainly at night. These vipers usually lie in wait, the anterior part of the body doubled into an S-shaped loop. They strike rapidly, their venom quickly sealing the fate of the victim – which seldom utters as much as an agonised squeal!

Like Gaboon Vipers, Puff Adders often move by rectilinear locomotion, sliding in straight lines like caterpillars. This may enable them to approach their prey unobserved. I think it probable, however, that the function of their cryptic coloration is probably more defensive than offensive, since these snakes are mainly nocturnal in habit and make themselves very conspicuous when disturbed – as do Saw-Scaled Vipers (*Echis carinatus*).

Adaptive coloration may function in several different ways in the same species. Many poisonous snakes rely upon aposematic (warning) colours for protection. In the case of Puff Adders, however, it may be more beneficial to escape notice when sunning themselves, unless disturbed. The first specimen I ever saw in the wild was at a picnic near Pretoria, in October 1942. One of the girls in the party, wearing only a bathing dress and sandals, was walking in front of me when she stepped clean over a small Puff Adder without even noticing it!

Puff Adders are ovoviviparous. In southern Africa, courtship usually takes place between October and December; and the young are born between March and May; while, in eastern Africa mating takes place in August and birth during November and December. The usual number of young is probably 25-50; but a specimen in Dvur Kralove Zoo (Czechoslovakia), 1.10m long, produced 157 living young, which is possibly a world record.