

# Envenoming by the viperid snake *Eristicophis macmahonii*

Van den Enden Erwin\*, Bottieau Emmanuel

*Institute of Tropical Medicine, Nationalestraat 155, Antwerp, Belgium*

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## Abstract

Little is known about the effects of bites by the rare viperid snake *Eristicophis macmahonii*. A 31-year-old Belgian man, who keeps these animals as a hobby, was bitten on a finger by one of his pets while trying to give it some medicine. The patient developed syncope, followed by a sudden extensive skin rash and massive edema of the arm. He recovered completely, except for a small area of limited tissue necrosis on the bitten finger.

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## 1. Introduction

The Asian sand viper *Eristicophis macmahonii* is also known as MacMahon's viper or leaf-nose viper, a name that refers to two pairs of large nasorostral scales whose lateral edges project on the snout. The species was first described by Alcock and Finn in 1897. The name *Eristicophis* refers to the ill-tempered nature of the animal (Greek *eristikos* = quarrelsome, *ophis* = snake). In 1906, this was misspelled as *Eristocophis*. This explains the etymology of *eristostatin* (see further). The specific name is sometimes wrongly written as *mcmahoni*, or *macmahoni* (the Latin genitive of *macmahonius* is *macmahonii*). This is important especially in the current time of keywords and computerized searches.

*Eristicophis macmahonii* is a small snake, endemic in the deserts of southern Afghanistan (south of the Helmand river), the extreme east of Iran and southwest Baluchistan between the Chagai Hills and the Siah Range (Pakistan), in areas with an altitude of less than 1200 m. These nocturnal animals live in a dry environment, with fine loose sand with sparse xerophytic plants as their habitat. Most of

the time they spend buried in the sand, except the snout, which is exposed. This burying behavior makes it not very popular with hobbyist, since often the animal cannot be seen in its cage. When people keep pet snakes, they often prefer showy species and/or dangerous ones, instead of small dull species or animals, which tend to hide. It was, therefore, unexpected that a bite by *E. macmahonii* occurred in Belgium.

## 2. Case report

A 31-year-old Belgian man, who keeps snakes as a hobby, was bitten on a finger by one of his pets while trying to give some medicine. His past medical history comprised eczema, and four other snake bites: 1994 *Agkistrodon intermedium* (local swelling on thumb), 1994 *Vipera latastei* (swollen hand), 1995 *Naja haje* (dry bite), 1999 *Vipera ammodytes* (limited local reaction). Since 2 years, the patient had five specimens of *E. macmahonii*. The animals were fed with mice. He used to milk the snakes and clean the cage himself. Recently a male snake fell ill and the patient tried to give it food and medication. The snake reacted by biting the tip of the third finger of his left hand. Initially, there was little pain. A couple of

\* Corresponding author. Tel.: +32 3 247 64 54; fax: +32 3 247 4 52.

E-mail address: evdenden@itg.be (V.E. Erwin).



Fig. 1. Necrotic fingertip 2 days after being bitten by the desert sand adder *Eristicophis macmahonii*. The massive edema of the arm and the skin rash had disappeared by this time.

minutes later he developed nausea without vomiting and a burning skin rash. He managed to phone for help before collapsing and remaining unconscious for about 5 min. Shortly after waking up, his left arm was very tender. The axillary nodes were swollen and painful. He had an ecchymosis on the left elbow. There was a generalized tremor. Pronounced paresthesias developed in the contralateral arm and fingers, without perioral tingling. There was pronounced muscular weakness, dyspnoea without bronchospasms, dysphagia and a very dry mouth. He was transferred to the hospital by his sister. Upon arrival in the hospital, the left arm was swollen. Blood pressure was 120/80. Heart rate was 92/min. Evaluation of bilateral ptosis was complicated by angioedema of the eyelids. There was no loss of vision. Oxygen, antihistamines and IV steroids were administered. He was transported to the intensive care unit. Atropine, neostigmine, adrenaline and antivenom were not administered. The initial eyelid edema, ptosis and dyspnoea improved during the following 12 h. The next morning, the rash decreased. A sensation of fatigue persisted for 2 days. Necrosis of the tip of the left third finger developed (see Fig. 1). The coagulation parameters stayed within normal limits at all times. No major hematological or biochemical abnormalities were noted. At present, 6 months after the bite, the patient regained full use of his arm. Only a small scar on the tip of the finger remains.

### 3. Discussion

Little is known about the effects of bites by the viperid snake *E. macmahonii* (Warrell, 1995). The only other bite

by this species in Belgium we know of was in 1985 (pers. comm.). It resulted in a permanent stiffness of the bitten hand. Five cases of bites were reported from Baluchistan (Shaw, 1925). All of them developed severe local swelling and inflammation. Two died several hours after the bite. A woman developed thirst and was unable to swallow and open the eyes, suggesting neurotoxicity.

Venom from *E. macmahonii* has been studied in some detail (Ali et al., 1999; Junaid and Syed, 2001). Crude venom contains the disintegrin eristostatin. It binds to the platelet fibrinogen-receptor GPIIb/IIIa, acting thus a potent inhibitor of platelet aggregation. This low molecular weight polypeptide is being studied for its ability to inhibit human and murine melanoma metastases in mouse model systems (McLane et al., 2001; Morris et al., 1995). It is yet unclear which mechanism eristostatin is used to accomplish this. In contrast, in our patient the coagulation parameters—including thrombocyte counts—were normal throughout the whole episode and there was no clinical bleeding. The small ecchymosis on the elbow was due to the mechanical trauma during syncope. An important problem in this case was the distinction between the hypersensitivity reaction from neurotoxicity. Allergic and even anaphylactic reactions after bites by other species are well recognized, particularly in snake handlers or those with frequent previous bites (Brooks and Graeme, 2004; Camilleri and Offerman, 2004). It is possible that the previous snake bites, as well as exposure to different antigens during routine care for the animals led to sensitization.

Neurotoxicity was suspected (dysphagia, ptosis), but the evaluation was complicated by angioedema. Neurotoxicity is usually associated with elapid bites, but is also known in other viper species (Kularatne, 2003; Beer and Putori, 1998). Not much is known about the optimal treatment of bites by *E. macmahonii*. There is no specific antivenom. Cross-protection with other antivenom, e.g. anti-*Echis*, has not been formally demonstrated. Supportive treatment is important.

In summary, this case of a bite by *E. macmahonii* illustrates the problems, which can be caused by exotic pets. These will become more common if the present trend of keeping venomous snakes increases. Responsible handling of these animals requires knowledge, training and experience, but bites can still occur.

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