

The Investigation of Snake-phobia Management by the Inhabitants of the City of Kumba, Southwest Region, Cameroon

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Abstract

Humans have had a long standing history of interaction hostility with snakes, and most snakes have been killed by this interaction in Cameroon and many other parts of the world. Basic education on snake conservation importance has to be provided to the communities to avoid unnecessary killing of snakes. The objective of this survey is to investigate the management of snake-phobia by the inhabitants of the city of Kumba. The research data collection witnessed the administration of two hundred and fifty questionnaires in the study area to a randomly selected population sample. The results recorded a significant association between Gender and snake phobia ($X^2 = 17.725$ $df=1$, $P<0.05$). In addition, there is a positive correlation between Profession and the knowledge people on non venomous snakes ($R^2 = 0.446$, $P<0.05$). Moreover, the survey revealed a significant link between the Age Category and Snake-phobia ($X^2 = 16.134$ $df=2$, $P<0.05$). Furthermore, there exist a significant association between the snake phobia and human reaction at snake sight ($X^2 = 16.521$ $df=3$, $P<0.05$). A respondent score of 70.15% is recorded on snake phobia. A respondent score of 56.72% is recorded on Black cobra, as a snake most commonly seen in the study area. Snakes are not human enemies, rather are important for human existence, ecologically and biomedically, hence their killing must be avoided during interactions. There need to be a public educational programme on the education of snakes species and behaviour to reduce and eliminate human snake-phobia. It is also very important to know that the existence of snakes should never be mystified, so many species commonly seen around like green tree snake (*Dendrelaphis punctulata*) are non venomous.

Keywords: Snake-phobia, Non-venomous snakes, Green-tree snake, Profession, Humans

INTRODUCTION

Human attitudes towards snakes can be both positive and negative (Moura *et al.* 2010; Alves RRN 2012). In some places, people possess a deep respect for snakes due to spiritual traditions (Miller 1970), while in other places people value snakes for utilitarian reasons (Alves RRN 2012; Somaweera and Somaweera 2010; Mendonça *et al.* 2014). However, snakes are typically misunderstood, mistreated, feared or killed, even when humans consider snakes to be symbols of power and worthy of worship worldwide (Sasaki *et al.* 2010). The consequences of negativity, ambivalence, fear, and killing of snakes for biodiversity conservation and human welfare have rarely been studied. Because snakes and snake parts are used in many different ways by different cultures, human activities can influence snake populations and communities both directly and indirectly. Therefore, snake-human interactions and the importance of ethnoherpetology (Alves and Souto 2015) must be considered when planning conservation actions (Alves *et al.* 2008; Alves *et al.* Albuquerque, 2012).

Snakes are animals that fascinate many people while frightening others. Good or bad, most people have strong feelings about snakes, but few people remain neutral (Gibbons and Dorcas, 2005). Snakes have been present in the religions of many cultures and today are still the cause of fear and myths. Many people are afraid of snakes. This seemingly irrational fear has prompted several studies examining the root of this fear as well as its pervasiveness. Some have suggested the fear is innate, but studies have shown that there is a learned component, though this may only be vicariously learned (Ohman and Mineka, 2003). Cook and Mineka (1990) found that laboratory raised rhesus monkeys learned from videos of wild rhesus monkeys to fear snakes but not flowers. This suggests that there is a component of acquired behavior, but that the behavior is not solely a learned behavior. These findings were strengthened by Ohman and Mineka (2001) who found that rhesus monkeys learned to fear potential predators, including toy predators. However, these primates did not learn to fear rabbits, which are not potential predators. These studies indicate that rhesus monkeys are predisposed to fear certain animals but not others.

Constantine *et al.* (2001) demonstrated that positive and negative pictorial cues affect human attention. Particularly, they observed that pictures of snakes provided the greatest amount of interference. Similarly, Blanchette (2006) found that humans could find fear-relevant objects, such as snakes, more quickly than fear-irrelevant objects, such as flowers. This indicates that threatening stimuli can more effectively capture our attention. This is consistent with the views of New *et al.* (2007) who suggest that in order to survive humans had to keep an eye out for other animals (predators, prey, or potential mates). LoBue and DeLoache (2008) expand upon this idea. Using a similar method as others (Blanchette, 2006) the authors went further in testing for a difference between adults and children. Both groups could more readily find the fear-relevant objects (snakes)

than fear- irrelevant ones. This demonstrates that the fear of snakes is at least partially innate since the children have not yet learned that fear. Further, snakes were not only compared against inanimate objects (flowers), but also against frogs and caterpillars as well. This would help determine whether skin texture or an elongated body would affect responses. In each experiment, participants were more adept at finding snakes than any of the fear-irrelevant objects. Whereas New *et al.* (2007) suggested humans had to be able to find animals in general, whether predators, prey, or potential mates, LoBue and DeLoache (2008) suggest that snakes grab our attention more than other animals and it is not based on skin texture or body shape.

Some have suggested that the mammalian brain has been shaped in part by snake fear and humans therefore exhibit subconscious reactions of fear toward snakes (Ohman and Mineka, 2001; Ohman and Mineka, 2003; Ohman, 2005; Ohman, 2007; Isbell, 2006). Central to this hypothesis is the amygdala, which controls the fear response (Ohman and Mineka, 2001). Ohman (2005) explains how the amygdala generates a fear response, even subconsciously. For example, humans were exposed to pictures of snakes with and without backward masking. Those who were afraid of snakes showed a fear response in the amygdala regardless of which type of picture it was; however, those who were not afraid of snakes still showed a fear response to backward masked pictures. This strongly suggests that the fear response was subconscious since the cortex of the brain was not triggered during backward masked pictures. Isbell (2006) proposed two evolutionary time periods when snake fear could have helped shape the mammalian brain. The first is approximately 100 million years ago, in the Middle Cretaceous. It is believed that the only predators faced by small mammals were constrictor snakes. In response to this pressure, the mammals would have evolved a specific neural circuitry to avoid being preyed upon. The second hypothesized event was approximately 60 million years ago in the early Tertiary with the rise of venomous snakes. This new pressure may have helped primates to evolve a better vision system to see the cryptic snakes. This hypothesis would account for the differences in the level of snake fear and visual systems of Old World and New World monkeys. Old World monkeys have the greatest fear of snakes and the best visual system to detect them.

Snakes have figured prominently in the history of mankind and still are important at the present time. In addition to their role in various religions, snakes are able to divert humans' attention (Constantine *et al.*, 2001; Ohman *et al.*, 2001; LoBue and DeLoache,

2008) and have been implicated in the development of the mammalian brain (Ohman and Mineka, 2001; Ohman and Mineka, 2003; Ohman, 2005; Ohman, 2007; Isbell, 2006). Due to an irrational, albeit subconscious, fear of snakes many snakes are killed needlessly. This could be avoided with a little understanding and education. Fear of snakes can be overcome regardless of its innate origins (Gibbons and Dorcas, 2005). Ohman (2005) shows this with the study of backward masked pictures. Even though people who were not afraid of snakes showed a fear response in the amygdala to backward masked pictures, they did not show the fear response when the pictures were not backward masked. This illustrates that fear of snakes can be overcome. The prominence of unfounded myths in modern society illustrates how little progress has been made in this area. However, overcoming this fear will first require an attitude of caring about our environment and its inhabitants followed by education about the reality of these misunderstood reptiles.

This study is focused on the management of snake-phobia by the inhabitants of the city of Kumba. The human association with snakes has had a tragic history even with the snake-charmers ending with a snake-bite and some died in this process. Snakes are commonly found in many parts of Cameroon but the phobia would not allow any body watch this animal, victims rather swing into shouting and calling for people to come and help in killing the snake. The rampant killing of this animal species in Kumba and other parts of Cameroon has drastically reduced its population in the wild.

MATERIALS AND METHOD

Description of the study area

Kumba is one of the cities in the Southwest Region of Cameroon. It is found at latitude 4°^{64'} North and longitude 9°^{45'} East with an elevation of 258m above the sea level, with a population of about 144,413 (Melle, and Ewane 2015). Kumba has a coastal equatorial climate, with two distinct seasons, a long rainy season of 8 months and a short dry season of 4 months. The annual amount of rainfall ranges from 2000mm to 4000mm.

The rainfall pattern provides a suitable condition for both perennial and annual crops to grow, thus providing an ideal condition for two cropping seasons a year (Melle, and Ewane, 2015). The rainfall here is one of the most important climatic factors influencing agriculture. Daily temperatures are high throughout the year and ranged from 28°C to 33°C. The atmospheric humidity varies with the absolute value and the seasonal distribution of the rainfall being uniformly high throughout the wet season and falling to lower level during the dry season. (Nkeng, 2009). Kumba municipality is mainly characterized by a coastal lowland possessing some wetland and flood zones. The lowland areas are the sites favorable for human settlement. The forest exploitation for farmland destroys the habitat of many wildlife species rendering them vulnerable to severe poaching. This is the main reason for the disappearance of many of the forest fauna species that existed in Kumba in the past.

However, a few wildlife species still exist in the area (Ndam, *et al* 2002).

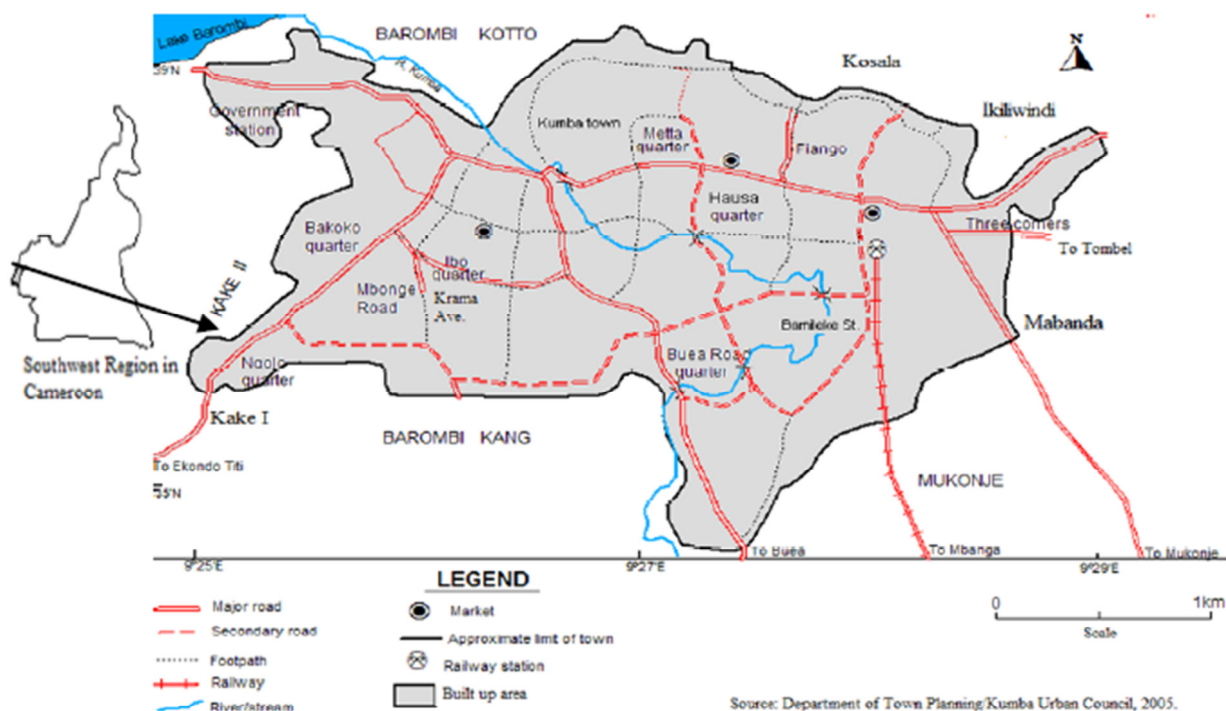


Figure 1. The map of Kumba (Department of Town Planning/KUC, 2005).

Food crop farming is the most important source of livelihood of the population around this area. The forest as direct source of income and subsistence through hunting and gathering is not very important for the overall population. Plantains, cocoyam and cassava are the most important agricultural products and contribute more than twice as much as cocoa and coffee to the daily livelihood. However, cocoa remains the main bulk income earner of the area (Ndam, 1998). On average the settlements are engaged in 3.7% alternative income-generating activities, but beside the various forms of livestock rearing, only beekeeping, cassava processing, fuel wood and timber harvesting have any relevance for the rural population. Agriculture is presently the most important economic activity carried out in the area, employing about 95% of the population, while timber exploitation, hunting and petty trading are also practiced by some inhabitants. Farm sizes range between 0.25 ha to more than 10 ha on average (Ndam, *et al* 2002). Non-indigenous farmers own the largest farms and account for most of the agricultural production of the area (Ndam, 1998). Livestock rearing is practiced for subsistence and for cultural sacrifices, which require the slaughtering of animals.

Data collection Method

A total number of two hundred and fifty questionnaires were administered in the study area within a period of two weeks. After a brief pilot study that lasted for one week various authorities in the city of Kumba were met for a discussion on the research purpose, and with a letter of research introduction issued by the university authority requesting for permission for the work to be carried out they were left with no doubtful understanding. All the questionnaires handed to the respondents were returned fully answered ensuring maximum cooperation and collaboration with the research team.

Data analysis

The research data was analyzed with the SPSS version 20. From this package the statistical tools used were chi-square and correlation to test both the quantitative and qualitative variables that in the questionnaires. Exploratory statistics was also used in the analysis of some of the variables.

RESULTS

The survey showed in fig.2 a significant link between Gender and snake phobia ($X^2 = 17.725$ $df=1$, $P<0.05$). In Kumba city both males and females fear all species of snakes, believing all snakes have potent venom. Though snake-bite victims are scarce, but the fact that snakes have a long standing history of venomous bites and most victims dying due to lack of urgent medical attention, has brought peoples thinking into precaution measures from the bites. Even though snake-bites are not common today, may be because the snake population has

reduced in human residential areas, in the past many snakes species are known to have claimed the lives of most its victims. On the other hand, fig.3 has revealed a positive correlation between Profession and the knowledge on non venomous snakes ($R^2 = 0.446$, $P < 0.05$). Many people in Kumba and other parts of Cameroon are yet to have knowledge on both venomous and non venomous snakes. The absence of this knowledge has lead to the indiscriminate killing of many species of snakes on farmlands, the wild and human residential areas. Today, most snake species are extirpated for this reason, and many others are still killed whenever spotted, especially in farms and residential areas.

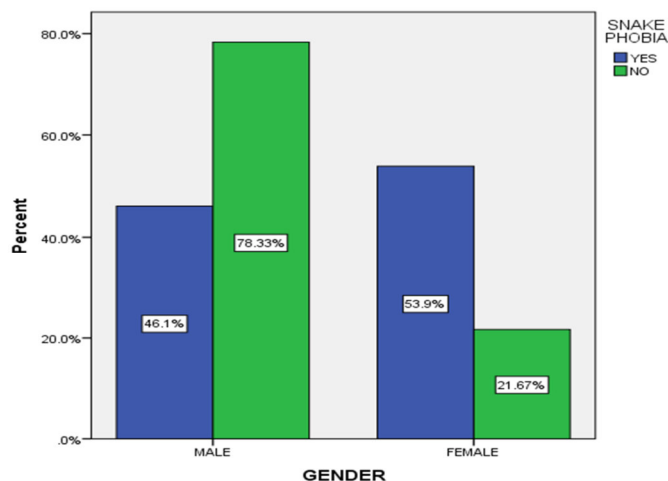


Fig.2: Gender and Snake Phobia

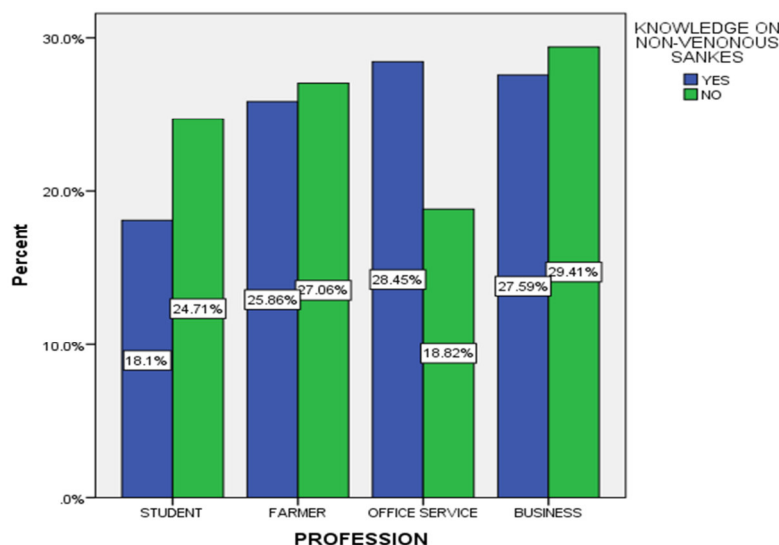


Fig.3: Profession and the knowledge on non venomous snakes

The research result showed a significant link in fig. 4 between the Age Category and Snake phobia in the study area ($X^2 = 16.134$ $df=2$, $P < 0.05$). Since reptiles, especially the snakes have a long history of injected very toxic venom into their victims during attacks, all age categories of people fear snakes in most parts of the world. Human relation with many reptile species has not been problematic as such except for the snake species which have claimed the lives of their victims bitten in many parts of the world. This phobic relationship between humans and snakes at all ages has descended down generationally to the level that it looks hereditary.

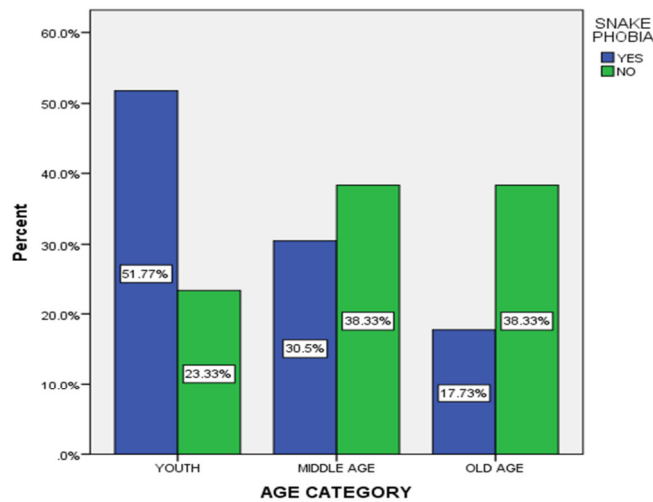


Fig. 4: Age Category and Snake Phobia

Figure 5 has shown a significant association between the snake-phobia and the human reaction at snake sight ($X^2 = 16.521$ $df=3$, $P<0.05$). Whoever sights a snake of any species any where quakes with uncontrollable fear, the fright source for many people is their thought on the deadly venom. For this reason only very few brave people have ever stood for a fight to get the snake killed or chasing it away, but even with these people it is believed that they still panic in the process of trying to kill the snake since snake-phobia seems difficult to completely overcome, especially when a snake is immediately spotted. Killing snakes takes more than normal courage, but needs past experience in on its killing.

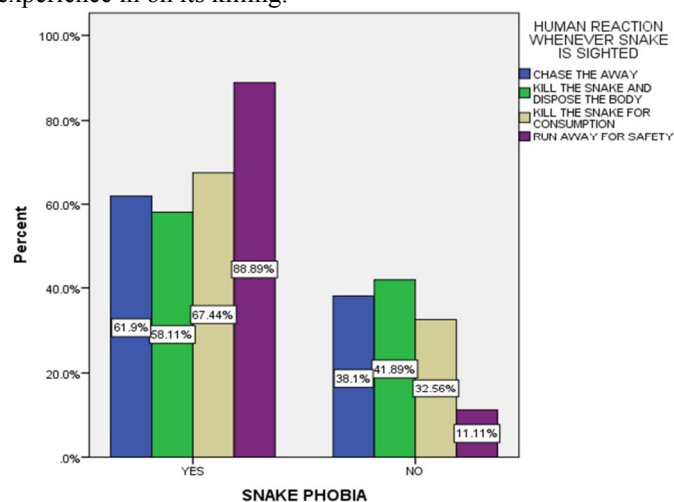


Fig.5: Snake phobia and Human reaction at snake sight

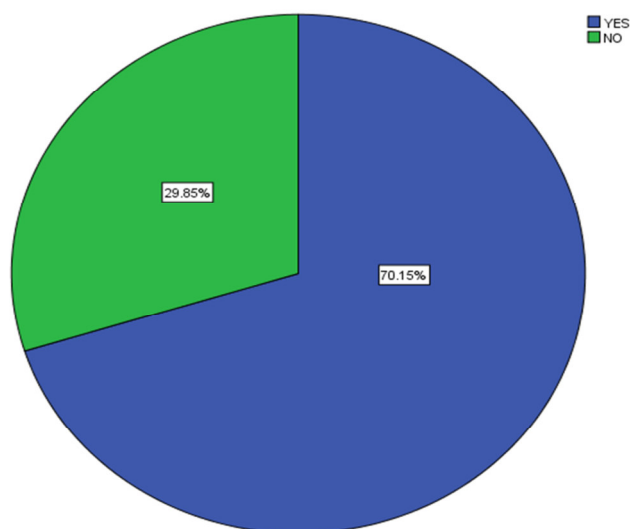


Fig.6: Snake-phobia

The survey recorded a respondent score of 70.15% on snake-phobia (fig.6). Many people panic when they spot a snake because of what they must have heard from others, not that they have seen a snake-bite victim. Snake hatred and phobia is much rooted into superstitious stories that often made about snakes. Interestingly, a respondent score of 29.85% was recorded on a human population claiming not to have snake-phobia. However, this respondent claim is doubted since nobody had ever thought them on snakes that are venomous and those not venomous. Whoever does not have a good knowledge on the venomous snake species is advised to flee from any snake whenever or wherever it is sighted.

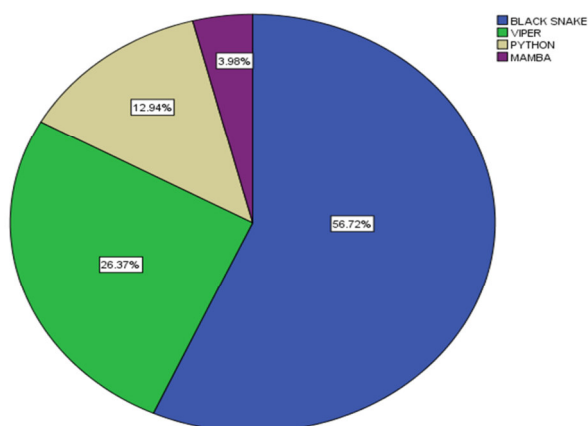


Fig.7: Snake species most easily seen

The survey showed that black cobra is the species of snake most commonly seen (56.72%) in fig 7 in the study area. From this finding, however, black cobra (*Naja melanoleuca*) seems to have a higher population than any other snake species in Kumba. Most people seem to have developed a craving appetite for its meat for consumption. Black cobra (*Naja melanoleuca*) is naturally diurnal and very shy, the reason for which it flees often when a human presence is spotted except on a situation where it is chased for a kill by humans provoking its behavioral aggressiveness.

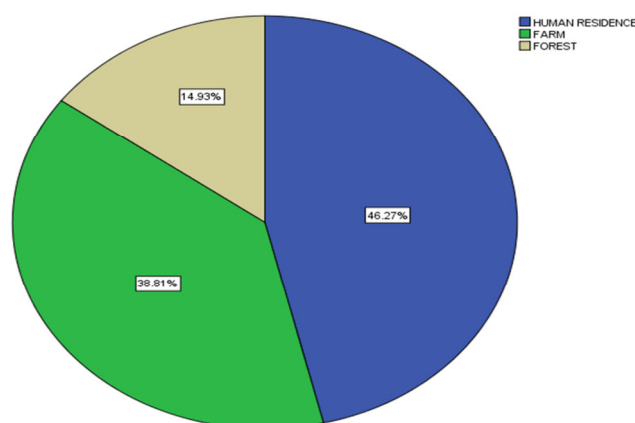


Fig.8: Areas where snakes are easily sighted

This survey has shown that most snakes are observed in human residential areas in Kumba (46.71%) fig 8. Surprisingly, the forest that is expected and believed to home snakes has recorded a respondent score of 38.81%. The reason might be that snakes in Kumba area, however, lack enough food or comfort in nearby bushes or farmlands where crop-farm chemicals like pesticides, herbicides, nematicides and some corrosive artificial fertilizers are used. There is also a need for a snake inventory study to be carried out in Kumba ecological zone to have knowledge on various snake species and their population. Secondly, the need for anti-venom snakes should be provided by the State government in all the medical centers in Kumba and health institutions in villages in this area to facilitate and prepare for snake-bites emergency treatment.

DISCUSSION

Snake-bite is an environmental, occupational and climatic hazard in rural and urban areas of many countries in the world. Snakes have adapted to a wide range of habitats and prey species. All snakes are predatory carnivores; none is vegetarian although some eat eggs. Since snakes are preyed upon by other animals, they tend to be secretive and have evolved many survival strategies. By understanding something about the habits of snakes, simple precautions can be adopted to reduce the chance of encounters and consequently bites. One must know the local snakes, the sort of places where they prefer to live and hide, the time of year and time of day or night and the kind of weather when they are most likely to be actively out and about. Many species are mainly nocturnal (night hunters) e.g. kraits, but other species are mainly diurnal (day-time hunters). Be specially vigilant about snake-bites after rains, during flooding, at harvest time and at night. Snakes prefer not to confront large animals such as humans so give them the chance to slither away.

In the house: Snakes may enter the house in search of food or to find a hiding place for a while. Do not keep livestock, especially chickens, in the house, as snakes may come to hunt them. Regularly check houses for snakes and, if possible, avoid those types of house construction that will provide snakes with hiding places (thatched rooves with open eaves, mud and straw walls with large cracks and cavities and large unsealed spaces beneath floorboards). If possible, try to avoid sleeping on the ground. If you have to sleep on the ground use an insecticide-impregnated mosquito net that is well tucked in under the mattress or sleeping mat. This will protect against mosquitoes and other biting insects, centipedes, scorpions and snakes (Chappuis *et al.*, 2007). No chemical has yet been discovered that is effectively repellent to snakes without being so toxic as to threaten the life of children and domestic animals.

Most snake-bites happen when the snake is trodden on, either in the dark or in undergrowth, by someone who is bare-footed or wearing only sandals. The snake may be picked up, unintentionally in a handful of foliage or intentionally by someone who is trying to show off. Some bites occur when the snake comes in to the home at night in search of its prey (other snakes, lizards, frogs, mice) and someone sleeping on the floor rolls over onto the snake in their sleep. Not all snake-bites happen in rural areas. For example, in some large cities, such as Jammu in India, people who sleep in small huts (*jhuggies*) are frequently bitten by kraits during the night and wake with paralysis (Saini *et al.*, 1986).

Some people who are bitten by snakes or suspect or imagine that they have been bitten, may develop quite striking symptoms and signs even when no venom has been injected. This results from an understandable fear of the consequences of a real venomous bite. Anxious people may over-breathe so that they develop pins and needles of the extremities, stiffness or tetany of their hands and feet and dizziness. Others may develop vasovagal shock after the bite or suspected bite-faintness and collapse with profound slowing of the heart. Others may become highly agitated and irrational and may develop a wide range of misleading symptoms. Blood pressure and pulse rate may increase and there may be sweating and trembling. Another source of symptoms and signs not

caused by snake venom is first aid and traditional treatments (Harris *et al.*, 2010). Constricting bands or tourniquets may cause pain, swelling and congestion that suggest local envenoming. Ingested herbal remedies may cause vomiting. Instillation of irritant plant juices into the eyes may cause conjunctivitis. Forcible insufflation of oils into the respiratory tract may lead to aspiration pneumonia, bronchospasm, ruptured ear drums and pneumothorax. Incisions, cauterization, immersion in scalding liquid and heating over a fire can result in devastating injuries.

Unfortunately, most of the traditional, popular, available and affordable first-aid methods have proved to be useless or even frankly dangerous. These methods include: making local incisions or pricks/punctures (“tattooing”) at the site of the bite or in the bitten limb, attempts to suck the venom out of the wound, use of (black) snake stones, tying tight bands (tourniquets) around the limb, electric shock, topical instillation or application of chemicals, herbs or ice packs. Local people may have great confidence in traditional herbal treatments, but they must not be allowed to delay medical treatment or to do harm (Harris *et al.*, 2010).

In the farm yard, compound or garden: Try not to provide hiding places for snakes. Clear termite mounds, heaps of rubbish, building materials etc. from near the house. Do not have tree branches touching the house. Keep grass short or clear the ground around your house and clear low bushes in the vicinity so that snakes cannot hide close to the house. Keep your granary away from the house, it may attract rodents that snakes will hunt. Water sources, reservoirs and ponds may also attract prey animals such as frogs and toads. Listen to wild and domestic animals, especially birds, as they warn of a snake nearby. Use a light when you walk outside the house or visit the latrine at night (WHO, 2010).

In the countryside: Firewood collection at night is a real danger. Watch where you walk, rather than walking bare-footed or wearing sandals, use proper shoes or boots and long trousers, especially when walking in the dark or in undergrowth. Step on to rocks or logs rather than straight over them – snakes may be sunning themselves on the sides. Do not put hands into holes or nests or any hidden places where snakes might rest. Use a light (torch, flashlight or lamp) when walking at night, especially after heavy rains. Be careful when handling dead or apparently dead snakes – even an accidental scratch from the fang of a snake’s severed head may inject venom. Snake restaurants pose a threat of bites to staff and customers. Many snake-bites occur during ploughing, planting and harvesting and in the rainy season. Rain may wash snakes and debris into gutters at the edges of roads, and flush burrowing species out of their burrows. Hence, be careful when walking on roads after heavy rain, especially after dark (WHO, 2010).

On the road: Drivers or cyclists should never intentionally run over snakes on the road. The snake may not be instantly killed and may lie injured and pose a risk to pedestrians. The snake may also be injured and trapped under the vehicle, from where it will crawl out once the vehicle has stopped or has been parked in the house compound or garage (WHO, 2010).

In rivers, estuaries and the sea: To prevent sea snake-bites, fishermen should avoid touching sea snakes caught in nets and on lines. The head and tail are not easily distinguishable. There is a risk of bites to bathers and those washing clothes in the muddy water of estuaries, river mouths and some coastlines (WHO, 2010).

General: Avoid snakes as far as possible, including those displayed by snake charmers who are frequently bitten. Never handle, threaten or attack a snake and never intentionally trap or corner a snake in an enclosed space. Keep young children away from areas known to be snake-infested. In occupations that carry a risk of snake-bite, such as rice farming and fish farming, employers might be held responsible for providing protective clothing (boots). In Myanmar, farmers can take out special low-cost insurance to cover them specifically against snake-bite (WHO, 2010).

CONCLUSION

In Cameroon and other parts of the world some snake species have become threatened due to land clearing for agriculture, urban development and through the introduction of animals such as domestic pets and the cane toad. Maintaining a high level of biodiversity is important to all life on Earth, including humans, and snakes are an important part of that biodiversity. Many people have a natural aversion of snakes, while many others simply hate them. However, the negative stigma that surrounds snakes is completely undeserved. Snakes are in fact extremely beneficial animals to have around. Snakes are absolutely paramount to the health of many eco-systems, the environment and to biodiversity. They are extremely valuable components to the ecological communities in which they live; playing several complex roles, including that of predators and prey. Without them the numbers of prey species would increase to unnatural levels and the predators that eat snakes struggle to find food. The natural predatory behaviors of snakes are also extremely valuable to humans. Many snake species prey heavily on insects and rodents. When snake populations decline the populations of these prey items increases, often causing serious problems to people. Insects and other arthropods can destroy gardens or enter people's homes where they will be undesired. When rodent populations surge, the animals can destroy crops at an alarming rate, affecting supplies of food to the food industries. They can also spread many harmful diseases. It is well

documented that rodents are also a leading cause of house fires, caused by the chewing of wires in walls.

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