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Accidents Caused by *Crotalus Durissus* (Rattlesnake Cascavel) in Northeast Brazil under Medical Ecology View

Noeme Cabral da Silva Santos;
Student of Master in Human Ecology and Environmental Management- Universidade do Estado da Bahia UNEB - *Campus* VIII

Artur Gomes Dias Lima;
Proferssor the Master in Human Ecology and Environmental Management- Universidade do Estado da Bahia UNEB - *Campus* VIII

Wellington Amancio the Silva
Student of Master in Human Ecology and Environmental Management- Universidade do Estado da Bahia UNEB - *Campus* VIII

Abstract
Accidents with *Crotalus durissus* (rattlesnake), are related to environmental conditions Favorable, with wide geographical distribution from the savannas of central Brazil, arid and semiarid regions of the Northeast, fields and open areas of South, Southeast and North. Considered accident of interest in public health. In most signs and Symptoms of minced allow the diagnosis of such poisoning. The objective of this paper is to present the number of occurrences of accidents with *Crotalus durissus*, the Northeast, in the period 2007 to 2013 This work was Conducted quantitative and qualitative secondary with date, Collected information of diseases notification system - SINAN 2014 in recent articles , with Relevant to the topic Studied approach Were date selected, Analyzed, systematized and tabulated. From 2007 to 2013 5292 accidents with *Crotalus durissus* the states of *Maranhão* and *Bahia* occurred in the Brazilian Northeast, are the ones that have higher rates of occurrences, Followed by the state of *Pernambuco*. Most of the accidents occurred in young males.
Keywords: Snake, Rattle, Medical Importance, Death

1. INTRODUCTION

Accidents with *Crotalus durissus* are related to favorable environmental conditions, the existence of snakes, increasing human activities, their susceptibility happens by the availability of food that this environment offers, such as rodents and other small animals.

Most snakes of interest in public health has terrestrial and nocturnal and feeds mainly on rodents (rats, mice, guinea pigs, etc.), which usually breed in sites close to residential, due to garbage dumps and rubble and grain storage, which constitute their food. In Brazil, Bothrops, accounts for 73.5% of reported cases of accidents, followed by *Crotalus* (7.5%), *Lachesis* (3.0%) and *Micrurus* (0.7%) (Bochner; STRUCHINER, 2003; BRAZIL, 2009).

According to the Secretariat of Health Surveillance / MS In Brazil, four types of accident are considered of interest in health: *Bothrops, Crotalus, laquetic, bothropic-laquetic* and *elaphidic*. Accidents not venomous snakes are relatively frequent, but do not cause major accidents, in most cases, and are therefore considered less medical importance. Accidents are facilitated by the behavior of venomous snakes of being coiled, real estate and camouflaged the banks of tracks, near gardens, sheds and bamboo groves in search of rodents, are related to environmental conditions favorable to the existence of snakes as food availability. Snakes of the genus *Crotalus* (rattlesnake Cascavel) are identified by the presence of bell or rattle at the caudal end. Are represented in Brazil by a single species (*Crotalus durissus*), with wide geographical distribution, from the savannas of central Brazil, arid and semi-arid regions of the Northeast, fields and open areas of South, Southeast and North (SURVEILLANCE SECRETARY FOR HEALTH / MS).

Of great clinical and pharmacological interest are the snakes in two very ordinary families in Brazil. The *Viparidae* family consists of the Crotalinae subfamily, with *Bothrops* (*jararaca* or *urutu*), *Crotalus* (Rattlesnake, Cascavel) and *Lachesis* (bushmaster); and the Elapidae family, with its Elapinae subfamily represented by the species *Micrurus* (coral verdadeira) (Nogueira and Sakate, 2004). They are also found in the vicinity of urban centers and residential areas near parks, forests, trails, rivers, streams, lakes and areas for planting and breeding. In most cases, the recognition of the clinical manifestations and epidemiological history of the crash enable diagnosis of the type of poisoning. The diagnostic means of identifying the animal is uncommon.

Do not show significant changes. Pain and swelling are usually discrete and restricted around the bite; *erythema* and *paresthesia* are common. The appearance of *neuroparalíticas* demonstrations have craniocaudal progression, starting by *ptosis*, blurred vision and *ophthalmoplegia*; Smell and taste disorders, and *mandibular*

ptosis and drooling may occur with each passing hour; Rarely the muscles of the rib cage is affected, causing acute respiratory failure. These neurotoxic manifestations regress slowly but are fully reversible; there may be other discrete gingival and bleeding. Increasingly, there are generalized *myalgia* and darkening of the urine color (color "coca cola" or "black tea"). Acute renal failure is the main complication and cause of death.

The objective of this work is to present a review of the accident with *Crotalus durissus* (rattlesnake), and event notifications rates in the Brazilian Northeast, the states of Bahia and Pernambuco, the data of Diseases Information System Notification-SINAN 2014 during the period 2007-2013.

For the development of this work was carried out a search of the SINAN databases and scientific articles with relevant approach to the subject studied in the Brazilian scientific production. Quantitative and qualitative data were selected, analyzed, systematized and tabulated.

The susceptibility of *Crotalus* accidents presented in this study with SINAN data 2014 shows the need for more attention and study actions, as it comes to accidents considered important for health and is related to the environment, the updated disclosure of event notifications crotalic these accidents could contribute as reasons the projects and actions aimed to control accidents.

2 THEORETICAL POINT REVIEW

This work is based on data side, which will address the *crotalic* accident notifications in Northeast Brazil specifically in the states of *Bahia* and *Pernambuco*, the characteristics of *Crotalus durissus* snake, clinical manifestation, the highest occurrences municipalities and the most affected sex.

2.1 *Crotalus durissus* (rattlesnake)

Some characteristics and other venomous snakes seen in: triangular head, loreais pits, small eyes with pupils in crack, scales on the head and teeth inoculators venom (*solenoglyphs*). Also have the stew in the terminal portion of the tail, peculiar feature of this snake genus. Inhabit savannas, open fields, dry, sandy and rocky regions and rarely along the coast of Brazil. Its incidence is relatively low, but the mortality is high (TAKAOKA et al, 1994; FUNASA, 2001; SPARROW, 2007).

Popularly known as "*Cascavel* snake", i.e, *Boicininga* or *Maracambóia*, the species *Crotalus durissus* is the only representative of the genus Crotalus in Brazil. They are terrestrial snakes, robust, little agile and easily identifiable by the presence of rattle in the caudal region. Present in all regions of the country, live in open fields, arid and semi-arid lands, and closed. On rating these snakes are grouped into six geographically distinct subspecies: *Crotalus durissus* dryinas found in the state of Amapá; *Crotalus durissus cascavella* identified in the savanna regions in the state of Maranhão, Ceará, Piauí, Pernambuco, Alagoas, Rio Grande do Norte and Bahia; *Crotalus durissus* collilineatus in the States of São Paulo, Mato Grosso, Minas Gerais, Goiás and the Federal District; *Crotalus durissus marajoensis* on Marajó Island; *Crotalus durissus ruruima* in Roraima and *Crotalus durissus terrificus* the states of São Paulo, Minas Gerais, Paraná, Rio Grande do Sul and also in open fields of Mato Grosso, Rondônia, Amazonas and Pará (BÉRNILS; COSTA, 2012;. GUIDOLIN et al, 2013; MELGAREJO, 2003).

The venom of *Cascavel* snakes is very powerful, six times more powerful than the Bothrops snakes, but does not result in local injury, but has myotoxic, neurotoxic and anticoagulant action (FUNASA, 2001; BARRAVIEIRA, 1994). General systemic manifestations include malaise, prostration, sweating, nausea, vomiting, drowsiness or restlessness and dry mouth, which can appear early (PEREIRA; PINE, 2001).

2.2 The occurrence of accidents crotalic

The snake bites have medical importance because of their frequency, severity and mortality. In Brazil, according to the Ministry of Health, there are between 19,000 to 22,000 snakebites each year. There are about 250 species of snakes, and of these, 70 are venomous.

According Pine & Pereira (2001) the occurrence of snakebite is generally related to climatic factors and increased human activity in the work in the field. The affected age range is 15-49 years and males the most prevalent.

Among the cases in which the genre was reported snake Bothrops accounted for 90.5% of the cases, 7.7% by *Crotalus*, *Lachesis* and *Micrurus* by 1.4% by 0.4%. The case fatality rate was 0.45%, higher in crotalic accidents (1.87%) (PINE & PEREIRA, 2001).

The number of accidents involving each species via, of course, according to their habits and habitats. In Brazil the *Crotalus* genus includes as representing the species *Crotalus durisus*, which inhabits savannas of central Brazil, the arid regions of the Northeast, the fields and open areas of South, Southeast and North. (CARVALHO, 2010).

2.3 crotalic Misadventures to genres

The crotalic accidents are the second highest number of victims, accounting for 7.7% of cases of snakebites

recorded in Brazil, which may represent up to 30% in some regions. Presents higher mortality brotopic that, because of the frequency with which evolves into IRA (SPARROW et al, 2007, JORGE RIBEIRO & 1992 FUNASA 2001).

According to Oliveira *et al*.; (2013) in accidents exists (52.0%) were male, reflecting the predominance of the male figure in local agriculture, a greater finding is in accordance with all national samples, and probably due to the greater frequency with which men perform activities in the field.

Menezes (2011) in their work through the results presented in his work can be seen that most of the injured were male (84%) as shown, due to the prevalence of men in activities related to cleaning yards, gardens or farms, developed by the inhabitants of the urban area thus generating greater exposure towards women. there was a significant number of accidents with females (16%), out of their home environment, treated as random events.

The largest number of cases related to men can be explained mainly by the occupation, since the rural activity is most commonly performed by men, which reinforces Barreto (2010), and the early initiative in agricultural work. Collaborating with the connotation that accidents by snake, is a work accident (FEITOSA, 1997; Lemos, 2009; COSTA, 2012).

2.4 clinical manifestations

Local symptoms are little evidencing in Crotalus poisoning. Patients may present site *paresthesia*, edema and *erythema* discreet, no complaints of severe pain. Classically, *myasthenic facies*, characterized by *papelbral aptose* and sagging facial muscles is the main characteristic for the clinical diagnosis. This symptom may be accompanied by intense *myalgia*, revealing injury of skeletal muscle fibers, confirmed by reddish brown and gradually the patient's urine, due to the presence of *myoglobin* (Figure 3) (*rhabdomyolysis* with *myoglobinuria*) (Azevedo - MARQUES; Hering; CUPO , 2003). In most cases, the recognition of the clinical manifestations and epidemiological history of the crash enable diagnosis of the type of poisoning. The diagnostic means of identifying the animal is uncommon.

Do not show significant changes. Pain and swelling are usually discrete and restricted around the bite; *erythema* and *paresthesia* are common. The appearance of neuro-paralytics demonstrations have *craniocaudal* progression, starting by *ptosis*, blurred vision and *ophthalmoplegia*; Smell and taste disorders, and *mandibling ptosis* and drooling may occur with each passing hour; Rarely the muscles of the rib cage is affected, causing acute respiratory failure. These neurotoxic manifestations regress slowly but are fully reversible; there may be other discrete gingival and bleeding. Increasingly, there are generalized *myalgia* and darkening of the urine color (color "coca cola" or "black tea"). Acute renal failure is the main complication and cause of death. (SURVEILLANCE SECRETARY FOR HEALTH / MS).

RESULTS AND DISCUSSION

Analyzing data from SINAN 2014, Brazil, from 2007 to 2013 were reported 15,066 cases of poisoning involving *Crotalus durissus* these, 151 came to death. In the northeast in the same period there were 5,292 accidents with Crotalus durissus, it is important to note that the State of Maranhão and Bahia, stand out because they have higher occurrences, followed by the state of Pernambuco. However there is significant variation in the states of Rio Grande do Norte, Alagoas and Sergipe (Figure 01)

The Cascavel snake (*Crotalus durissus*) have been recognized over time as events in arid or semiarid regions. Among the families of medically important snakes, viperid are undoubtedly the most important group for public health due to the high frequency of accidents and the most serious accidents registered, not only in Brazil but in other American countries The species wider distribution was, followed by *Bothrops erythromelas* and *B. leucurus*. The first, recorded in all northeastern states, the second, with the sole exception of the State of Maranhão and the third with the sole exception of the State of Piauí. Of the 673 occurrences in the state of Pernambuco were reported by SINAN 2014 549 occurrences for males and 124 for females in the period 207-2013 (Figure 02);

In the state of Pernambuco by SINAN data 2014 showed a total of 303 notifications despite a large number of other municipalities, Slough Mother of God Agreste and the metropolitan area of Recife are the highest occurrences following municipalities of the Wild, Serra Talhada and Ouricuri (Figure 03).

In the state of Bahia, 1044 events were reported during the period 207/2013, the data SINAN 2014 791 occurrences for males and 260 for females. (Figure 04)

Of the 1044 incidents reported in Bahia in the period 2007/2013, the main events were the municipalities of Luiz Eduardo Magalhães, in eastern Bahia, Vitoria da Conquista, in the South, following the municipalities Sao Desiderio and Barriers in the Sao Francisco Valley (Figure 05).

Disease prevention and control

To avoid the presence of snakes near the residence, it is important to carry out the cleaning of areas around the

house, barn or planting, eliminating piles of rubble, garbage accumulation or dried foliage and food scattered in the environment. These measures prevent the approach of rats, as they are the main food of snakes (FUNDACENTRO, 2001).

It is recommended the use of personal protective equipment such as shoes, boots, leather gloves and others that can greatly reduce these accidents (PINE & PEREIRA, 2001).

The inclusion of snakebite in the list of occupational diseases with proper supervision could represent a breakthrough in public health, not only for the prevention but also for an early and correct routing of those accidents, reducing mortality and temporary uselessness and even sometimes , permanent caused by this condition (PINE & PEREIRA, 2001).

FINAL CONSIDERATIONS

Considering the data collected, it was possible to observe the various occurrences in Brazil and in the Northeast. Despite the existing regional differences, there are a high number of accidents with *Crotalus durissus*. We can see the vulnerability of rural populations mainly related to the activities of the field, as male, since its operations in the risk environment is more frequent.

The recommendations of prophylaxis measures, there is a lack in the affected populations about the dangers they are exposed to, and the form of first aid, where the incorrect routing can complicate the picture and lead to death. It is recommended wider dissemination these populations over control to avoid these accidents.

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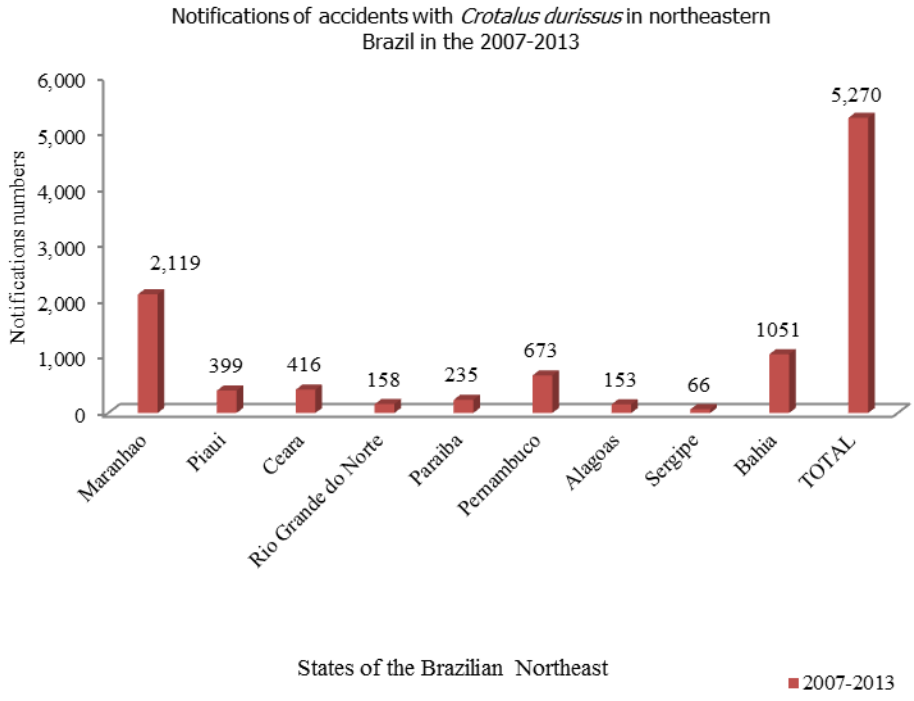
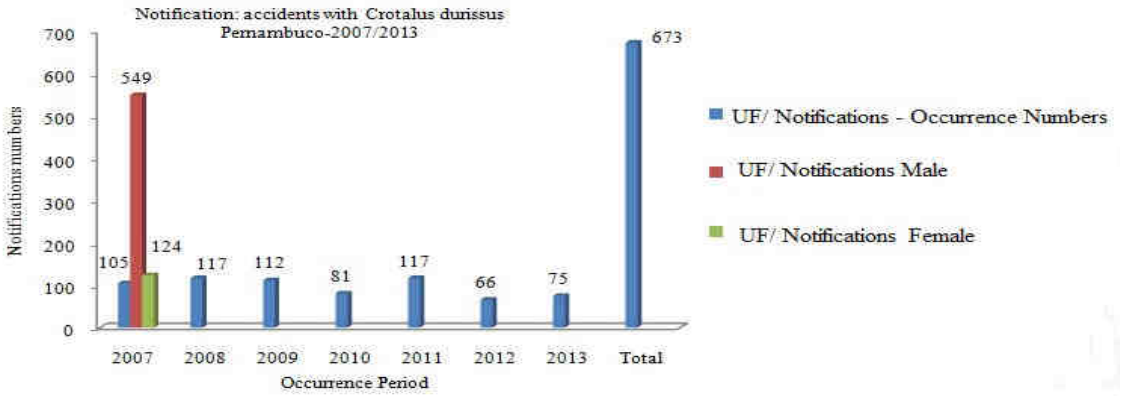
Figure 01- Notifications of accidents with *Crotalus durissus* in northeastern Brazil in the 2007-2013 period



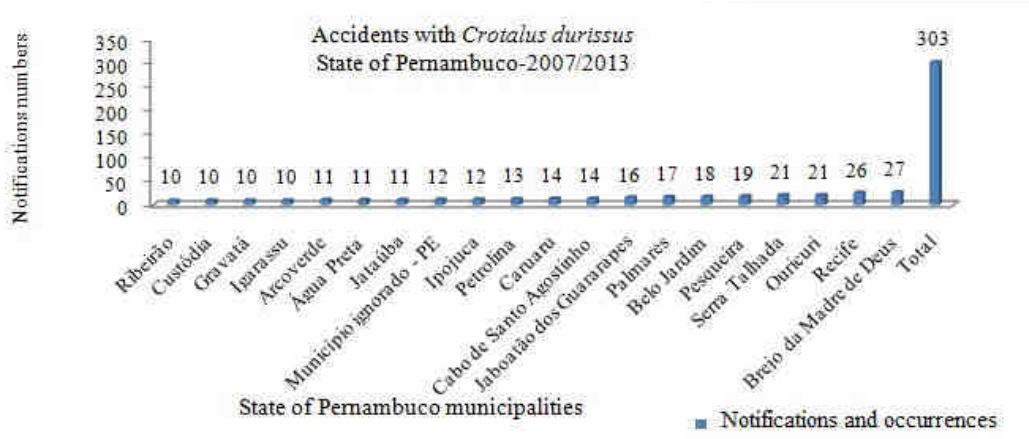
Source: SINAN 2014.

Figure 02- occurrences of *Crotalus durissus* accidents in Pernambuco in males and feminino.2007 / 2013



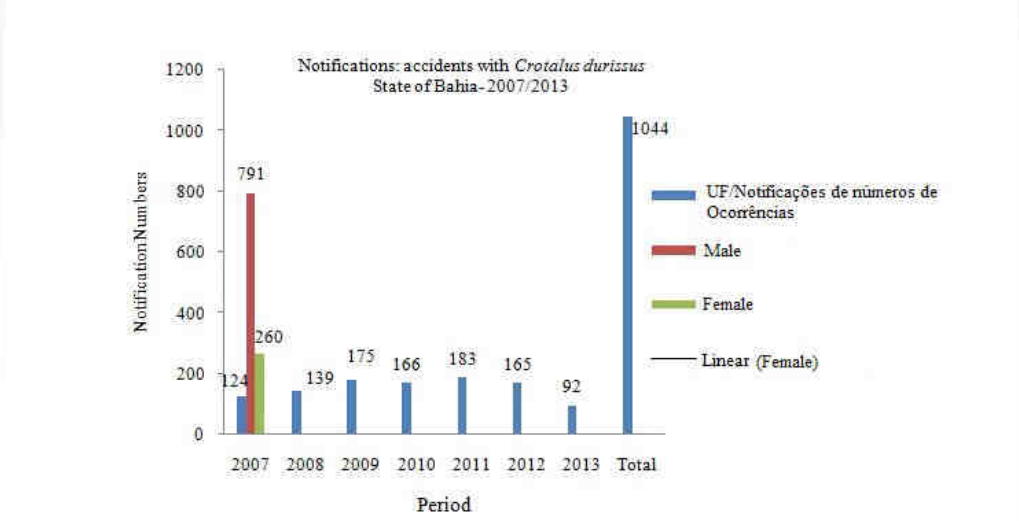
Font- System for Notifiable Diseases Information - SINAN 2014.

Figure 03- Municipalities higher occurrences of *Crotalus durissus* accidents in Pernambuco 207/2013



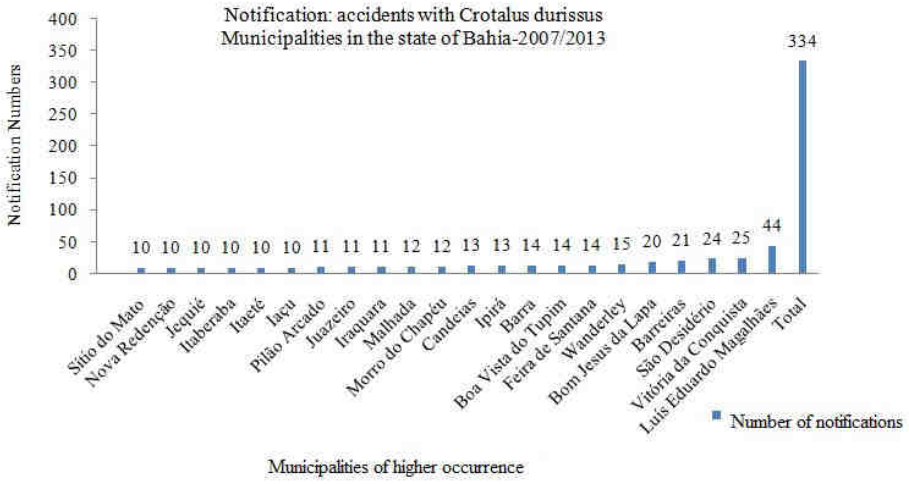
Font- System for Notifiable Diseases Information - SINAN 2014.

Figure 04- occurrences of *Crotalus durissus* accidents in the state of Bahia male and female 207/2013.



Font- System for Notifiable Diseases Information - SINAN 2014.

Figure 05- Municipalities of major accidents occurrences *Crotalus durissus* in the state of Bahia, 207/2013.



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