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Rescue and rehabilitation of snakes during the floods of November and December, 2015 at Chennai, Tamil Nadu, India

Janani S, Maheshwaran Govender, Leenu J, Samuel T, *Raveen R
Department of Zoology, Madras Christian College, Chennai 600 059, Tamil Nadu, India.

Abstract
Nature has become unpredictable causing severe water shortage on one hand and at times sudden flooding and on the other hand making man responsible for the root cause for such climatic changes. Flooding causes extensive damage to human life and property along with loss of flora and fauna. In Chennai, manifold increase in population has resulted in encroachment of the water bodies. Chennai city houses a population of herpetofauna especially snakes. The unprecedented flooding of Chennai city and its suburbs during the months of November and December, 2015 resulted in extensive loss of human life, animals and habitat loss to both man and animal. Keeping in view of the above mentioned factors, the present study was done to assess and record what this natural calamity has caused to the snake population in Chennai city along with their rescue and rehabilitation measures during this time.

Keywords: Floods, Chennai, snakes, 2015

1. Introduction
Flooding is a serious disaster that occurs due to natural causes or man-made activities or a combination of both. It causes extensive damage to human life and property along with loss of flora and fauna. Chennai, formerly known as Madras, is the fourth largest metropolitan area in India and the capital city of the Indian state of Tamil Nadu. Located on the Coromandel Coast of the Bay of Bengal, Chennai has an estimated population of 4.9 million, with an area that has grown from 176 to 426 sq. km after an expansion from the year 2011. The urban agglomeration, which includes the city and suburbs, has a population estimated at nine million. This makes it the fourth most populous metropolitan area in India and the 31st largest urban area in the world [1]. Chennai is plagued with haphazard development and rapid urbanization of its ever expanding suburbs. Manifold increase in population has resulted in encroachment of the water bodies and their inflow and outflow channels thus reducing them substantially. On one hand nature has become unpredictable causing severe water shortage and at times sudden flooding and on the other hand man himself is the root cause for such climatic changes.

In spite of such rapid urbanisation of Chennai city, there exists a population of herpetofauna especially snakes. Generally, there are more than 3000 species of snakes in the world and they live in both terrestrial and aquatic ecosystems and are predatory carnivores with wide range of prey species [2, 3]. India harbours 518 species of reptiles which include three species of crocodiles, 34 species of turtles and tortoises, 202 species of lizards and 279 species of snakes belonging to 28 families [4]. Reptiles have seen consistent population declines throughout the world, which are attributed to a variety of factors, including land use patterns, *viz*., habitat loss and degradation [5]. Reptiles play a significant role in the ecosystem sustenance as links in food chains, bio-monitors in controlling many pests and also as excellent ecological indicators owing to their high degree of sensitivity to even a minor change in the environment [6-8].

Chennai received 1,049 mm of rainfall in November, the second highest recorded since November 1918 with 1,088 mm [9, 10]. On 15th November, 2015 about 266 mm of rainfall was recorded in Chennai and its suburbs and on 1st December, 2015 the total rainfall recorded was 490 mm. The flooding in Chennai city was described as the worst in a century [11]. This had caused unprecedented flooding of Chennai city and its suburbs resulting in extensive loss of human life, animals and habitat loss to both man and animal. Therefore, the present study was done to assess and record what this natural calamity has caused to the snake population in Chennai city along with their rescue and rehabilitation measures.

2. Materials and methods
The Rapid Response Teams of the Tamil Nadu Forest Department in Chennai, Tamil Nadu, India responded swiftly to the phone calls of the people of Chennai during the days of flooding regarding entry of snakes along with the water into their homes. The data pertaining to the rescue operations from different locations of Chennai *viz*., date of rescue, species of snakes rescued, locality of rescue and location of release were obtained from the Forest Department, analysed and presented. The obtained data was from 4th November, 2015 to 30th December, 2015.

3. Results
A total of 406 individuals belonging to four families, 10 genera and 10 species were rescued during the study period (Table 1; Figure 1 & 2) out of which two species were venomous and eight non venomous. The venomous species were Indian spectacled cobra-*Naja naja* and Indian Russell's viper-*Daboia russelii*. Among the venomous species, *Naja naja* was the most abundant (95%) than *Daboia russelii* (5%) (Figure 3). Among the non-venomous species, the Indian rat snake-*Ptyas mucosa* was the most abundant (28%) followed by Checkered keelback-*Xenochrophis piscator* (23%), Striped keelback-*Amphiesma stolata* (18%), Common vine snake-*Ahaetulla nasutus* (17%), Common Indian trinket-*Coelognathus helena* (7%), Common bronzeback tree snake-*Dendrelaphis tristis* (6%), Common wolf snake-*Lycodon aulicus* (0.5%) and Red sand boa-*Eryx johnii* (0.5%) (Figure 4).

Table 1: List of species of snakes rescued in November and December, 2015 in Chennai city during the days of flooding

S. No.	Family and common name	Scientific name	Number of snakes	Occurrence (%)	Venomous and non-venomous (%)
Venomous					
I	**Elapidae**				
1.	Indian Cobra	*Naja naja*	52	12.80	95
II	**Viperidae**				
2.	Indian Russel's Viper	*Daboia russelii*	3	0.73	5
Non-venomous					
III	**Colubridae**				
3.	Indian rat snake	*Ptyas mucosa*	100	24.63	28.49
4.	Checkered keelback	*Xenochrophis piscator*	81	19.95	23.07
5.	Striped keelback	*Amphiesma stolata*	62	15.27	17.66
6.	Common vine snake	*Ahaetulla nasutus*	60	14.77	17.09
7.	Common Indian trinket	*Coelognathus helena*	23	5.66	6.55
8.	Common Bronzeback tree snake	*Dendrelaphis tristis*	20	4.92	5.69
9.	Common wolf snake	*Lycodon aulicus*	3	0.73	0.85
IV	**Boidae**				
10.	Red sand boa	*Eryx johnii*	2	0.49	0.56

4. Discussion

The incessant rains that plagued Chennai city not only created water logging on the streets but also saw dangerous reptiles including snakes slithering into several homes in the city and its suburbs. It was reported that residents from several neighbourhoods, mainly Pallikaranai, Madipakkam, Chitlapakkam and Kilkattalai in south Chennai and Vyasarpadi and Kolathur in the north, have been calling up the wildlife headquarters office regularly, complaining that snakes have been entering their homes along with flood waters and requesting that the reptiles be rescued [12]. Media reported that rat snakes and bronzeback tree snakes were commonly spotted slithering into homes along with cobras [13]. Snakes are commonly regarded as slimy, slithering creatures worthy of fear and disgust [14]. Army personnel involved in rescue operations were also not spared the threat of snakes [15]. On sighting snakes in and around their homes, people started hitting them with sticks as a panic reaction as snakes are obviously fearsome creatures to many humans [16]. Residents complained that they were unable to see the snakes entering their homes due to lack of power supply. The inundated Chennai Airport saw numerous snakes seeking refuge in tyres and under belly of airplanes. It was also reported that a viper bit two aircraft maintenance personnel [13].

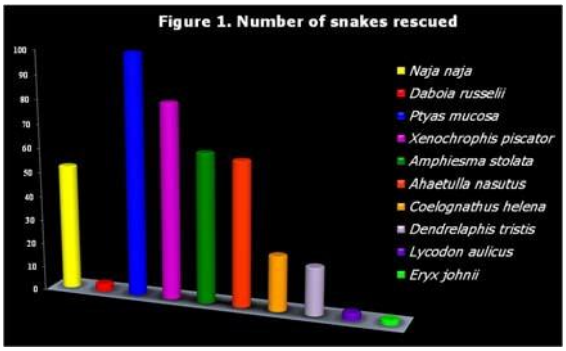
The snakes that were rescued during the floods were released in suitable habitats in the outskirts of Chennai city in places like Oragadam and Tada. Oragadam (12°51′33.4″N 79°57′38.7″E) is a town and industrial area located on the outskirts of Chennai and has a large piece of forest which is protected. It is located 55 km Southwest of Chennai metropolitan city and is centrally located between Grand Southern Trunk Road (NH 45) and NH 4. Tada (13°5′2″N 80°16′12″E) is a village on the Chennai - Kolkata highway, just over 65 km from Chennai and 80 km from Tirupati. It is located in Nellore district of Andhra Pradesh, India, about 1.5 km north of the Andhra Pradesh border.

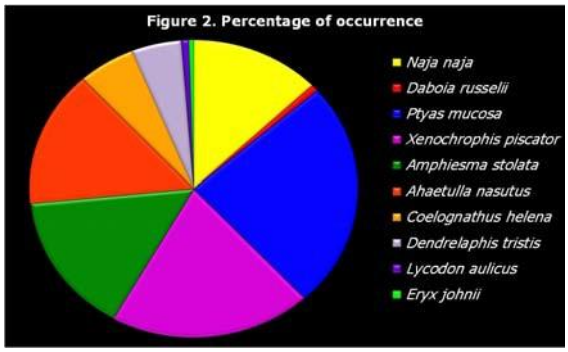
There are frequent incidents where a snake enters a house or a garden and the sight of any snake is a frightening situation for a common man. The observer immediately panics and either gets rid of it or kills it. All snake species are legally protected under Indian Wildlife (Protection) Act, 1972 from Schedule I to Schedule IV [17]. In spite of this legal protection, many snake species are killed brutally, especially in the rural areas of India. While most people kill the reptiles, some have learnt to live with them [18]. A few sensible people act wisely instead of panicking, believing that the snake should not be hurt and should be safely moved out of their property. They immediately call for the snake rescuers, either from the Fire Brigade, Forest Department or from some local non-government organization (NGO) [19].

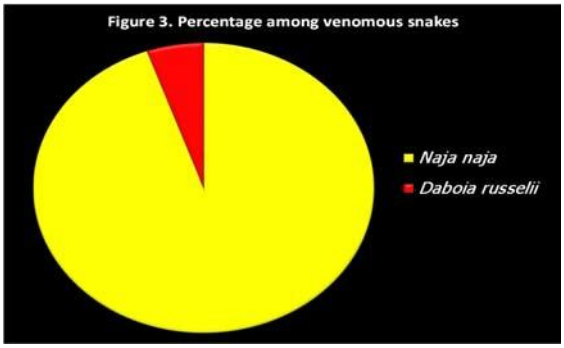
The diversity of snakes rescued from flood affected areas indicate that there was distress among the terrestrial and arboreal species due to flooding. The species diversity was found to be fairly high with the Indian rat snake being the most abundant among the non-venomous species that were rescued and the Indian spectacled cobra being high in number among the venomous species. Snake rescue studies under normal climatic conditions have produced similar results wherein high numbers of cobra and rat snake indicate their common habitat and adaptability. This can also be attributed to the occurrence of prey species *viz*., rats and toads near human habitations [19]. The cobra is worshipped from ancient times [20] by the people and is rarely killed compared to the other species. Even though flooding was largely attributed to very heavy rainfall, it was also considered to be man-made. It was widely acknowledged that the water bodies and their water ways such as inflow and out flow channels were encroached upon thereby preventing the quick discharge of flood water [21].

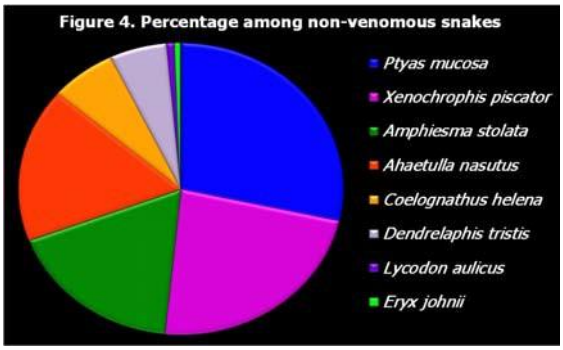
Globally, the reptilian fauna is one of the targeted faunas facing trouble due to anthropogenic developments [5]. An urban development or expansion victimizes reptiles firstly, ultimately resulting in the deterioration of the fauna by habitat destruction or alteration. Such situation ends up with too many reptilian species co-existing with the urban world [22]. Rapid urbanisation of a city and its suburbs has raised the numbers of reptilian species in the newly developed urban areas located in the outskirts of the city, including numbers of snake species [23] as evident in Chennai city. A few species of snakes have adapted to human habitation, especially in the suburban backyards, urban gardens, roofed houses (old style) and open sewages. Thus, urban habitation acts as advantageous habitat for few snake species, in terms of food and shelter, however, the flooding of Chennai city has exposed its weakness in terms

of non/slow drainage of storm water, encroachment of water bodies and their water ways resulting in extensive loss of human and animal life along with destruction of habitat. Therefore, such anthropogenic activities have threatened the very survival of flora and fauna thereby questioning the suitability of Chennai as a safe haven for such biotic life.









5. References

1. WPR. World Population Review, http://worldpopulationreview.com/world-cities/chennai-population/2015.
2. WHO. Guidelines for the prevention and clinical management of snakebite in Africa. World Health Organization Regional Office for Africa, Brazzaville, 2010, 145.
3. Bijees KB. A study to evaluate the effectiveness of structured teaching programme on management of snake bite among staff nurses at selected hospitals in Bangalore, Karnataka. M.Sc. Dissertation, Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka, 2012, 189.
4. Aengals RVM, Kumar S, Palot MJ. Updated Checklist of Indian Reptiles. http://zsi.gov.in/checklist/Checklist%20of%20 Indian%20Reptiles.pdf (online version) 2011.
5. Gibbons JW, Scott DE, Ryan TJ, Buhlmann KA, Tuberville TD, Metts BC *et al*. The global decline of reptiles, déjà vu amphibians. Bio Science. 2000; 50:655-666.
6. Lips KR. Decline of a tropical montane amphibian fauna. Conservation Biology. 1998; 12:106-117.
7. Roy D. Amphibians as environmental sentinels. Journal of Bioscience. 2002; 27:187-188.
8. Daniels RJR. Impact of tea cultivation on anurans in the Western Ghats. Current Science. 2003; 85:1415-1422.
9. Chaitanya SVK. Chennai receives highest rainfall in Tamil Nadu. Deccan Chronicle. Retrieved from http://www.deccanchronicle.com/151114/nation- current-affairs/article/chennai-receives-highest-rainfall- tamil-nadu, 2015.
10. Chennai misses new rain record by a whisker. The Hindu. Retrieved from http://www.thehindu.com/news/cities/chennai/chennai-misses-new-rain-record-by-a-whisker/article7936508.ece, 2015.
11. Tamil Nadu floods LIVE: Chennai officially declared disaster zone; PM Modi takes stock of situation. Zee News. Retrieved from http://zeenews.india.com/live-updates/tamil-nadu-chennai-rains-live-updates- 1829037, 2015, 2.
12. Snakes, uninvited guests, slither into homes during monsoon deluge. The Times of India. Retrieved from http://timesofindia.indiatimes.com/city/Chennai/Snakes-uninvited-guests-slither-into-homes-during-monsoon-deluge/articleshow/49838818.cms, 2015, 19.
13. Variyar M. Cobras, rat-snakes create panic in Chennai homes flooded by rains; forest officials rescue 100 snakes. Ibtimes. Retrieved from http://www.ibtimes.co.in/cobra-rat-snakes-create-panic-chennai-homes-flooded-by-rain-forest-officials-rescue-100-snakes-655475, 2015.
14. Öhman A, Mineka S. The malicious serpent: Snakes as a prototypical stimulus for an evolved module of fear. Current Directions in Psychological Science. 2003; 12(1):5-9.
15. Mehta T. Cobra, Cobra: An army rescue mission in flooded Chennai. NDTV. Retrieved from http://www.ndtv.com/Chennai-news/cobra-cobra-an-army-rescue-mission-in-flooded-chennai-1250630 2015.
16. Agras S, Sylvester D, Oliveau D. The epidemiology of common fears and phobias. Comprehensive Psychiatry. 1969; 10:151-156.
17. Vyas R. Snake handling. Reptile Rap. 2007; 8:15- 19.
18. Snakes, leeches-uninvited guests in Chennai homes. The Hindu. Retrieved from

http://www.hindu.com/news/cities/Chennai/snakes-leeches-uninvited-guests-in-chennai-homes/article 7883284.ece 2015.
19. Vyas R. Snake diversity and voluntary rescue practice in the cities of Gujarat State, India: An evaluation. Reptile Rap. 2013; 15:27-39.
20. Wakankar VS. Painted Rock Shelters of India. Archives and Museums. M.P, Bhopal, 2005.
21. Man-made disaster: Look how Chennai built its way to floods. India Today. Retrieved from http://indiatoday.intoday.in/story/chennai-floods-man-made-disaster-building-construction/1/537094.html 2015.
22. McKinney ML. Urbanization as a major cause of biotic homogenization. Biological Conservation. 2006; 127:247-260.
23. Purkayastha J, Das M, Sengupta S. Urban herpetofauna: a case study in Guwahati city of Assam, India. Herpetology Notes. 2011; 4:195-202.