



Species Composition and Perceptions of Snakes in a Village within the National Chambal Sanctuary, Uttar Pradesh, India

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India is home to nearly 350 species of snakes (Jangid et al. 2021). The frequency of encounters between humans and snakes has risen as urbanization encroaches on natural areas and degrades increasingly smaller and isolated remnants of natural habitats (Purkayastha et al. 2011). Those encounters typically end with snakes being killed. Persecution is a major factor in the decline of Indian snake populations (Baruah and Sengupta 1999) with people killing snakes out of fear for their safety without knowledge of the laws that protect snakes or the importance of snakes to the environment (Vyas 2013).

India had an estimated 58,000 snakebite deaths per year from 2001 to 2014 (Suraweera et al. 2020), with the greatest mortality in rural areas that lack medical facilities. Nevertheless, and despite the prevalence of venomous species (Whitaker and Martin 2014), snake conservation is important. Snakes play important roles in ecosystems (Gibbons et al. 2000) and also help humans by controlling rodent populations that damage crops and carry disease (Pandey et al. 2016). Oriental Ratsnakes (*Ptyas mucosa*), for example, are known as the “farmer’s friend” (Gulshan 2020). However, the lack of knowledge about snake populations in a particular area limits the possibility of developing conservation and management plans.

Herein we provide information about one such shared community and perceptions of snakes held by local residents of the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India (26.76440°N, 78.80882°E) (Fig. 1). This information is based on snakes rescued from the village and interviews with residents.

Garaita, which covers an area of about 0.45 ha near the Chambal River, has a human population of 800–1,000, most of whom are engaged in growing crops that include mustard, wheat, and pearl millet (= Bajra), and a few who depend on arid forest resources. Common plants in the area include Khair (*Acacia catechu*), Palash (*Butea monosperma*), and Ber (*Ziziphus mauritiana*). Previously grassy patches are now fully

covered by the invasive Mexican Mesquite (*Prosopis juliflora*) plant. The surrounding vegetation provides suitable habitat for frogs, lizards, and small rodents, which attract snakes that often enter and hide in houses. However, only two snakebites with no mortality have been reported from the village and no snakebites occurred during the course of this study.

Snakes were rescued at the request of local residents when they were encountered in houses or the surrounding areas. Rescues closely followed the Guidelines for Snake Rescue and Release in Maharashtra (Bhide 2018). After snakes were identified (using the field guide by Whitaker and Captain 2008) and photographed, they were released on the same day into suitable habitat.

From July 2018 to March 2020, we rescued a total of 31 snakes of 13 different species in four families (Table 1; Figs. 2–4), half of the number of species that had been documented

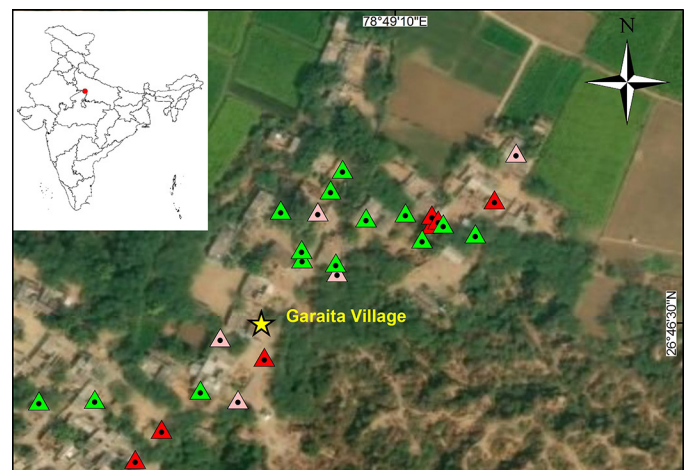


Fig. 1. Map of the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India, showing the locations where snakes were rescued. Green triangles indicate sites where nonvenomous snakes were rescued, pink triangles sites where mildly venomous snakes were rescued, and red triangles sites where venomous snakes were rescued.

Table 1. Species of snakes rescued from the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India, from July 2018 to March 2020.

Species	Local Name	Number Rescued
Erycidae		
Common Sandboa (<i>Eryx conicus</i>)	Mitti Wala Saap	1
Red Sandboa (<i>Eryx johnii</i>)	Domuha or Kuchlan	1
Colubridae		
Common Catsnake (<i>Boiga trigonata</i>)	—	3
Common Bronze-backed Tree Snake (<i>Dendrelaphis tristis</i>)	Dhariwala saap	5
Common Wolfsnake (<i>Lycodon aulicus</i>)	—	3
Streaked Kukri (<i>Oligodon taeniolatus</i>)	—	1
Oriental Ratsnake (<i>Ptyas mucosa</i>)	Dhaman or Ghoda-pachad	3
Dumeril's Black-headed Snake (<i>Sibynophis subpunctatus</i>)	Kala muh wala saap	1
Black-headed Royal Snake (<i>Spalerosophis atriceps</i>)	Rajatbansi or Kala muhwala saap	3
Natricidae		
Checkered Keelback (<i>Fowlea piscator</i>)	Panni wala saap or Paniha	1
Green Keelback (<i>Rhabdophis plumbicolor</i>)	Ghaas wala saap	1
Elapidae (venomous)		
Common Krait (<i>Bungarus caeruleus</i>)	Kariya	3
Spectacled Cobra (<i>Naja naja</i>)	Naag	5

from the entire Chambal River Basin (Nair and Krishna 2013). Most were rescued in the months of September and October (Fig. 5), which is the end of the monsoon season. Interestingly, all of the eight venomous snakes that were rescued were inside houses.

To evaluate knowledge and perceptions of snakes, we interviewed 32 randomly selected villagers between the ages of 16 and 82. We conducted these interviews in July 2020, which is the beginning of the season when snakes are most

frequently encountered. Of the residents surveyed, 17 were farmers, four were students, and 11 were classified as “other” (this included shepherds, retired army personnel, and a vegetable seller). Respondents ranged from illiterate (3) to having a higher secondary (23) or graduate or postgraduate (6) education. We recorded responses on printed questionnaires. All questions were in a Yes-or-No format.

The snake-perception survey (Table 2) showed that 21 of 32 respondents considered every snake venomous, 29 worshiped

**Fig. 2.** Snakes in the family Erycidae rescued in the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India: (A) Common Sandboa (*Eryx conicus*), (B) Red Sandboa (*Eryx johnii*). Photographs by Pawan Pareek.



Fig. 3. Snakes in the family Colubridae rescued in the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India: (A) Common Wolfsnake (*Lycodon aulicus*), (B) Streaked Kukri (*Oligodon taeniolatus*), (C) Dumeril's Black-headed Snake (*Sibynophis subpunctatus*), (D) Black-headed Royal Snake (*Spalerosophis atriceps*). Photographs by Pawan Pareek.



Fig. 4. Snakes in the families Natricidae and Elapidae rescued in the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India: (A) Green Keelback (*Rhabdophis plumbicolor*), (B) Common Krait (*Bungarus caeruleus*), (C) Spectacled Cobra (*Naja naja*). Photographs by Pawan Pareek (A, C) and Vivek Sharma (B).

Table 2. Responses to a survey regarding knowledge and perceptions of snakes by 32 residents of the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India.

Questions	Yes	No
Attitudes toward Snakes		
Do you like snakes?	14	18
Do you ignore snakes you encounter in the fields while working?	19	13
Do you ignore snakes you encounter on a path while walking?	22	10
Do you ignore snakes you encounter in a house or barn?	14	18
Do you worship snakes?	29	3
Do you believe all snakes should be conserved?	22	10
Do you consider snakes as friends of farmers?	22	10
Is the snake rescue operation offered by TSA staff useful?	30	2
Do you know of any deaths due to snakebite?	10	22
Are you familiar with any snake-awareness program?	0	32
Awareness and Traditional Beliefs		
All snakes surrounding us are venomous.	11	21
Snakes can be reborn.	17	15
Snakes eyes can “photograph” people in order to take revenge on them.	23	9
Encountering a snake on a journey bodes a good future.	14	18
Snakes can suckle milk from cows, goats, or sheep.	20	12
Always kill both of a pair of snakes to avoid revenge by a survivor.	17	15
Snakes possess invaluable ‘Mani’ stones.	22	10
Some snakes guard the property of people.	23	9
Some snakes have two-mouths.	23	9
Snakes (e.g., cobras) dance to music.	29	3
Dead people can be reborn as snakes?	15	17
Do wishful snakes exist?	24	8
Do snakes have beards and moustaches?	26	6
Beliefs regarding First Aid and Hospital Care of a Venomous Snakebite		
Would you visit a healthcare facility supplied with anti-venom?	16	16
Envenomation can be cured by anti-venom.	24	8
Is a nearby snakebite treatment center available?	12	20
Would you visit a traditional healer?	21	11
Would you suck on a snakebite wound?	20	12
Would you incise a snakebite wound?	26	6
Would you squeeze a snakebite wound?	25	7
Would ingesting chilies help heal a snakebite?	15	17
Would ingesting Ghee help heal a snakebite?	9	23
Would you apply another traditional concoction topically?	6	26

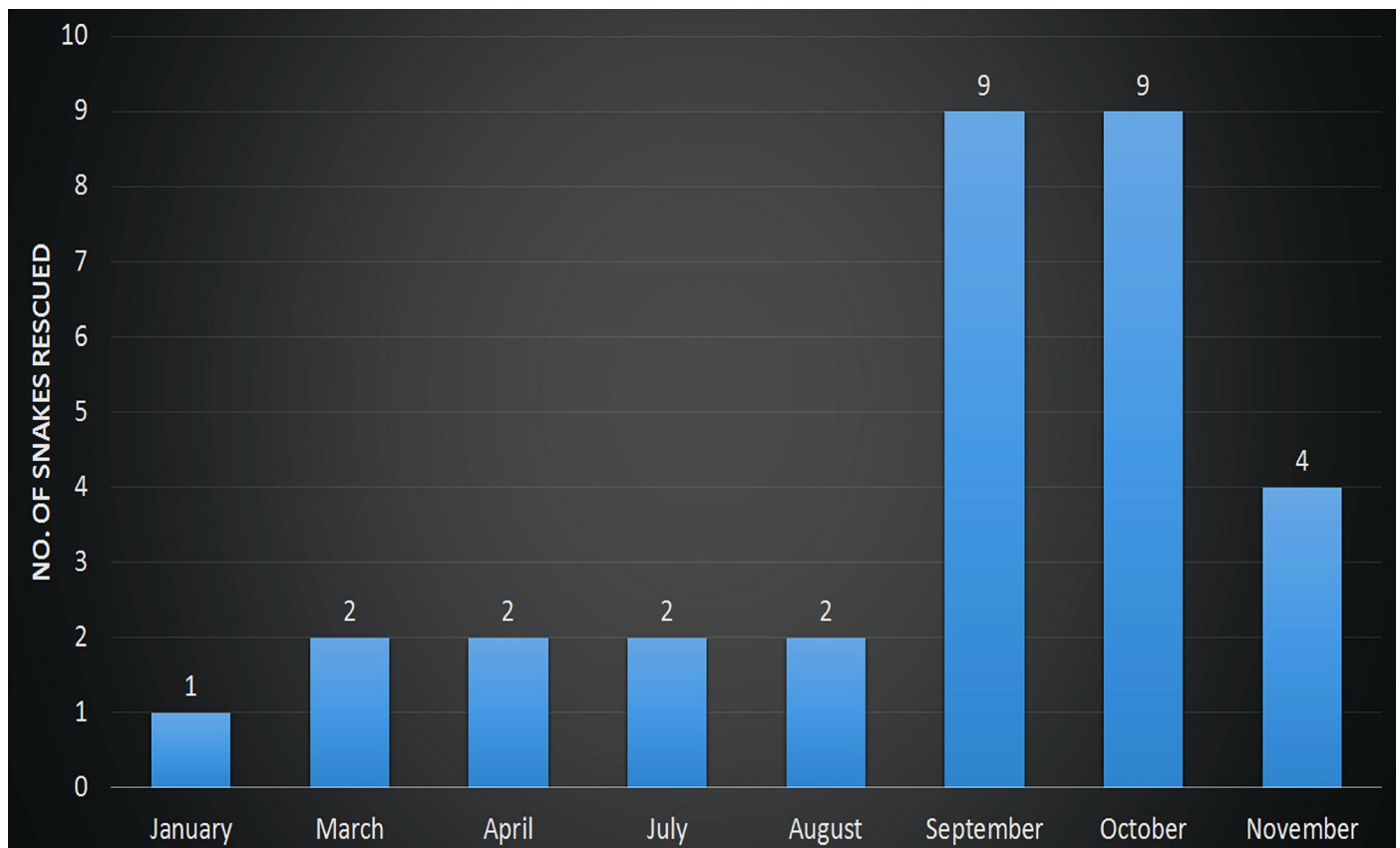


Fig. 5. Monthly numbers of snakes rescued in the village of Garaita in the National Chambal Sanctuary, Etawah District, Uttar Pradesh, India.

snakes as a god or their own ancestors, 22 agreed that snakes are friends of farmers, and 22 believed that snakes may be conserved as long as they do not bite anyone in the village. Everyone surveyed knew about the snake-awareness programs and, notably, no snakes were killed by villagers during this period.

If abundance and diversity of snakes are indicative of a healthy ecosystem, these data suggest that the area has not yet been overly affected by anthropogenic activities and should be considered a high priority for conservation efforts. Also, we believe the snake-awareness program was successful. Although respondents did not know about the importance of snakes in healthy ecosystems, generally could not differentiate between venomous and harmless snakes, and had previously killed every snake encountered thinking them venomous, they appreciated and readily took advantage of the rescue program, clearly demonstrating the efficacy of education when combined with ready access to a rescuer.

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Literature Cited

- Baruah, M. and S. Sengupta. 1999. Threats to snakes of Assam with special reference to Kamrup District. *Zoos' Print Journal* 14: 37–38. <https://doi.org/10.11609/zp.v14i2.4491>.
- Bhide, K. 2018. महाराष्ट्र राज्य सर्पमत्सिंसाठी मार्गदर्शक तत्वे/ आचारसंहिता. Guidelines for Snake Rescue and Release in Maharashtra. Forest Department Maharashtra, Government of Maharashtra, India. English text available at: [http://mahaforest.gov.in/fckimagefile/Snake%20Rescue%20Guideline%20English\(1\).pdf](http://mahaforest.gov.in/fckimagefile/Snake%20Rescue%20Guideline%20English(1).pdf).
- Gibbons, J.W., D.E. Scott, T.J. Ryan, K.A. Buhlmann, T.D. Tuberville, B.C. Metts, J.L. Greene, T. Mills, Y. Leiden, S. Poppy, and C.T. Winne. 2000. The global decline of reptiles, déjà vu amphibians. *BioScience* 50: 655–666. [https://doi.org/10.1641/0006-3568\(2000\)050\[0653:TGDORD\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2000)050[0653:TGDORD]2.0.CO;2).
- Gulshan, A. 2020. The Indian Rat Snake is a well-behaved reptile. *The Hindu*, 30 July 2020. <https://www.thehindu.com/sci-tech/energy-and-environment/indian-rat-snake-in-the-monsoon/article32227685.ece>.
- Jangid, A.K., A. Kamdar, K. Kunte, and A. Pyron. 2021. Classification of Indian reptiles. In: A. Khanekar, P. Roy, and K. Kunte (eds.), *Reptiles of India. Version 1.25*. Indian Foundation for Butterflies, Bengaluru, Karnataka, India. <https://www.indianreptiles.org/classification>.
- Nair, T. and Y. Krishna. 2013. Vertebrate fauna of the Chambal River Basin, with emphasis on the National Chambal Sanctuary, India. *Journal of Threatened Taxa* 5: 3620–3641. <https://doi.org/10.11609/JOTT.03238.3620-41>.
- Pandey, D.P., G.S. Pandey, K. Devkota, and M. Goode. 2016. Public perceptions of snakes and snakebite management: implications for conservation and human health in southern Nepal. *Journal of Ethnobiology and Ethnomedicine* 12: 22. <https://doi.org/10.1186/s13002-016-0092-0>.
- Purkayastha, J., M. Das, and S. Sengupta. 2011. Urban herpetofauna: a case study

- in Guwahati City of Assam, India. *Herpetology Notes* 4: 195–202.
- Suraweera, W., D. Warrell, R. Whitaker, G. Menon, R. Rodrigues, S. Hang Fu, R. Begum, P. Sati, K. Piyasena, M. Bhatia, P. Brown, and P. Jha. 2020. Trends in snakebite deaths in India from 2000 to 2019 in a nationally representative mortality study. *eLife* 2020: e54076. DOI: 10.7554/eLife.54076.
- Vyas, R. 2013. Snake diversity and voluntary rescue practice in the cities of Gujarat State, India: an evaluation. *Reptile Rap* 15: 27–39.
- Whitaker, R. and A. Captain. 2008. *Snakes of India. The Field Guide*. Draco Books, Chennai, Tamil Nadu, India.
- Whitaker, R. and G. Martin. 2014. Diversity and distribution of the medically important snakes of India, pp. 115–136. In: P. Gopalakrishnakone, A. Faiz, R. Fernando, C.A. Gnanathan, A.G. Habib, and C.-C. Yang (eds.), *Clinical Toxinology in Asia Pacific and Africa*. Springer, Dordrecht, The Netherlands. https://doi.org/10.1007/978-94-007-6288-6_16-1.