



Communal Oviposition by Spectacled Cobras, *Naja naja* (Linnaeus 1758), in West Bengal, India

Prajwal Ray¹, Chandrima Bose², Soumitra Roy², and Bappa Sarkar³

¹Wildlife Institute of India, Chandrabani, Dehradun 248001, Uttarakhand, India (prajwalray066@gmail.com)

²Bonding with Animals and Nature (BAN) Foundation, West Bengal, India

³Bangaon, North 24 Parganas, West Bengal, India

Oviposition in snakes can be categorized into solitary and communal (Vaz-Ferreira et al. 1970; Graves and Duvall 1995; Blouin-Demers et al. 2004). The latter has been described as non-incidentally sharing of the same egg-laying cavity by two or more conspecific females (Espinoza and Lobo 1996). In snakes, communal oviposition has been recorded chiefly in Nearctic (Fowler 1966; Brodie et al. 1969; Parker and Brown 1972; Palmer and Braswell 1976; Swain and Smith 1978), Palearctic (Goin and Goin 1971), Australian (Covacevich and Limpus 1972), and Neotropical taxa (Vaz-Ferreira et al. 1970; Cadle and Chuna 1995; Albuquerque and Ferrarezzi 2004; Braz et al. 2008), and has also been tested as a method for estimating population sizes (Luiselli et al. 2011). Factors favoring communal oviposition could be scarcity of suitable egg-laying sites or being of some benefit to the parties involved (mothers, eggs, and hatchlings) (Doody et al. 2009).

The only documentation of communal oviposition in India was two clutches of 12 and 15 eggs deposited by Common Kraits (*Bungarus caeruleus*) that were found with

four adult snakes in a single pile of sandstone (Webb-Peploe 1946). Based on a single observation from West Bengal, we herein report communal oviposition in Spectacled Cobras (*Naja naja*), a venomous elapid found in India, Bangladesh, Nepal, Bhutan, Pakistan, and Sri Lanka (Wallach et al. 2014). These snakes are highly adaptable and thrive in habitats that include agricultural landscapes and human settlements (IUCN 2021). During March–July, females lay about 12–30 eggs, which hatch in approximately 60 days (Whitaker and Captain 2008). Eggs usually are laid inside rodent burrows or termite mounds (Whitaker 1978).

At about 1500 h on 4 April 2024, while on a rescue call at Chhatni, Barasat, North 24 Parganas, West Bengal, India (23.10056, 88.70313; elev. 44 m asl), BS found three adult Spectacled Cobras (two females, one male) along with three old egg clutches comprising a total of 74 eggshells (unmeasured). A local resident had noticed two large cobras in and around an abandoned toilet in his home, under the concrete floor of which these snakes allegedly hid. After the two snakes were caught, removal of the toilet bowl and concrete



Figure 1. Two visible clutches of Spectacled Cobra (*Naja naja*) eggs found after the removal of concrete under an abandoned toilet (left). A total of 74 eggshells from three clutches found at the site showing signs of hatching, decomposition, and invertebrate infestation. Photographs by Bappa Sarkar.

chunks from a ca. 1-m² area revealed the presence of another snake as well as three clutches (two visible, one hidden) (Fig. 1). Apparently, rodent burrows were abundant in the soil beneath the floor, thus providing excellent hiding places for the snakes. The three clutches contained 20, 25, and 29 eggs, respectively. After the three snakes were released in nearby suitable habitat, a closer inspection of the eggshells suggested recent hatching, although we were unable to identify an exact time period. The brownish appearance of some eggshells with irregular puncture marks also indicated that at least some of the eggs were decomposed and/or infested by invertebrates in the soil (Fig. 1). Although the eggs might have been deposited by the resident females, we could not establish an exact hatching time or determine when these females started occupying that microhabitat. However, since the total number of eggs (74) was well above the largest recorded clutch size for *N. naja* (45) (Daniel 2002), we believe this to have been a case of communal oviposition, of which this, to the best of our knowledge, is the first record for this species.

Acknowledgement

We thank Mr. Vivek Sharma for his valuable input during the preparation of this manuscript.

Literature Cited

- Albuquerque, C.E. and H. Ferrarezzi. 2004. A case of communal nesting in the Neotropical snake *Sibynomorphus mikanii* (Serpentes, Colubridae). *Phyllomedusa* 3: 73–77. <https://doi.org/10.11606/issn.2316-9079.v3i1p73-77>.
- Blouin-Demers, G., P.J. Weatherhead, and J.R. Row. 2004. Phenotypic consequences of nest-site selection in black rat snakes (*Elaphe obsoleta*). *Canadian Journal of Zoology* 82: 449–456. <https://doi.org/10.1139/z04-014>.
- Braz, H.P.B., F.L. Franco, and S.M. Almeida-Santos. 2008. Communal egg-laying and nest-sites of the Goo-eater Snake, *Sibynomorphus mikanii* (Dipsadidae, Dipsadinae) in southeastern Brazil. *Herpetological Bulletin* 106: 26–30.
- Brodie, E.D., Jr., R.A. Nussbaum, and R.M. Storm. 1969. An egg-laying aggregation of five species of Oregon reptiles. *Herpetologica* 25: 223–227.
- Cadle, J.E. and P.M. Chuna. 1995. A new lizard of the genus *Macropholidus* (Teiidae) from a relictual humid forest of northwestern Peru, and notes on *Macropholidus ruthveni* Noble. *Breviora* 501: 1–39.
- Covacevich, J. and C. Limpus. 1972. Observation on community egg-laying by the Yellow-faced Whip Snake, *Demansia psammophis* (Schlegel) 1837 (Squamata: Elapidae). *Herpetologica* 28: 208–210.
- Daniel, J.C. 2002. *The Book of Indian Reptiles and Amphibians*. Oxford University Press, Oxford, UK.
- de Silva, A., K. Ukuwela, G. Shankar, B. Srinivasulu, A. Das, R. Vyas, N.S. Sawant, N.U. Kulkarni, V. Deepak, S. Thakur, P. Mohapatra, C. Srinivasulu, and N.S. Achyuthan. 2021. *Naja naja*. *The IUCN Red List of Threatened Species* 2021: e.T62241A3110222. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T62241A3110222.en>.
- Doody, J.S., S. Freedberg, and J.S. Keogh. 2009. Communal egg-laying in reptiles and amphibians: Evolutionary patterns and hypotheses. *The Quarterly Review of Biology* 84: 229–252. <https://doi.org/10.1086/605078>.
- Espinoza, R.E. and F. Lobo. 1996. Possible communal nesting in two species of *Liolaemus* lizard (Iguania: Tropiduridae) from northern Argentina. *Herpetological Natural History* 4: 65–68.
- Fowler, J.A. 1966. A communal nesting site for the smooth green snake in Michigan. *Herpetologica* 22: 231.
- Goin, C.J. and O.B. Goin. 1971. *Introduction to Herpetology*. 2nd ed. W.H. Freeman and Co., San Francisco, California, USA.
- Graves, B.M. and D. Duvall. 1995. Aggregation of squamate reptiles associated with gestation, oviposition, and parturition. *Herpetological Monographs* 9: 102–129. <https://doi.org/10.2307/1466999>.
- Luiselli, L., L. Rugiero, and M. Capula. 2011. Are communal nesting counts as useful as mark-recapture data for estimating population size in snakes? *Herpetological Journal* 21: 78–81.
- Palmer, W.M. and A.L. Braswell. 1976. Communal egg laying and hatchlings of the rough green snake, *Ophedrys aestivus* (Linnaeus) (Reptilia, Serpentes, Colubridae). *Journal of Herpetology* 10: 257–259. <https://doi.org/10.2307/1562991>.
- Parker, W.S. and W.S. Brown. 1972. Telemetric study of movements and oviposition of two female *Masticophis t. taeniatus*. *Copeia* 1972: 892–895. <https://doi.org/10.2307/1442762>.
- Swain, T.A. and H.M. Smith. 1978. Communal nesting in *Coluber constrictor* in Colorado. *Herpetologica* 34: 175–177.
- Vaz-Ferreira, R., L.C. Zolessi, and F. Achával. 1970. Oviposición y desarrollo de ofidios y Lacertilios em hormigueros de Acromyrmex. *Physis* 29: 431–459.
- Wallach, V., K.L. Williams, and J. Boundy. 2014. *Snakes of the World. A Catalogue of Living and Extinct Species*. CRC Press, Boca Raton, Florida, USA.
- Webb-Peploe, C.G. 1946. Breeding habits of the Common Krait (*Bungarus caeruleus*). *Journal of the Bombay Natural History Society* 45: 437.
- Whitaker, R. 1978. *Common Indian Snakes. A Field Guide*. Macmillan India Limited, New Delhi, India.
- Whitaker, R. and A. Captain. 2008. *Snakes of India. The Field Guide*. Draco Books, Chennai, India.