



OPEN ACCESS

Ophiophagy in the saw-scaled viper (*Echis carinatus*) from the UAE

The saw-scaled viper, *Echis carinatus* (Schneider, 1801), is a widespread venomous snake found across arid and semi-arid regions of the Middle East and South Asia (McDiarmid *et al.* 1999). It is a generalist predator, known to feed predominantly on arthropods (particularly scorpions and centipedes), small lizards, rodents, and occasionally amphibians (Whitaker & Captain 2004, Saki *et al.* 2020), and generally exhibits opportunistic feeding patterns typical of Old-World vipers (Mallow *et al.* 2003). Despite a well-documented dietary breadth, no prior observations or records of ophiophagy (snake-eating behavior) exist for this species.

In contrast, blind snakes of the genus *Myriopholis* Hedges, Adalsteinsson & Branch, 2009 are highly fossorial, adapted to subterranean lifestyles, and are rarely observed above ground except during specific environmental circumstances. *Myriopholis macrorhyncha* (Jan, 1860), in particular, inhabits sandy and stony deserts and is characterized by its extremely small size, smooth scales, and burrowing behavior (Daniels 2002, Egan 2007, Wallach *et al.* 2014). Due to their elusive nature and limited surface activity, these blind snakes are seldom recorded in predation events.

Here, I describe a novel trophic interaction between *Echis carinatus* and *Myriopholis macrorhyncha* based on direct field observations and photographic evidence. The viper was identified as *Echis carinatus* based on the following diagnostic features (Mukherjee 2021): a total length of approximately 50 cm; a moderately stout, strongly keeled body; a short, triangular head distinct from the neck; small, heavily keeled head scales lacking large shields;

a short, rounded snout; large nostrils directed upward and outward; and relatively large eyes with vertical pupils. The tail was short and tapering. The dorsum was pale with a series of oblique whitish bands enclosing darker brown or chestnut blotches, each bordered anteriorly and posteriorly by pale edges that formed a zig-zag pattern. A distinct pale post-ocular stripe extended diagonally to the mouth angle, the crown was mottled with brown and gray, and the tail tip bore a narrow blackish subterminal band—all characteristic of *E. carinatus*.

This observation was recorded in the Dubai Desert Conservation Reserve (DDCR), a protected area of 225 km² in the Emirate of Dubai that harbors notable biodiversity, including at least 26 reptile species, and is currently undergoing a year-long baseline survey of nocturnal reptiles to assess species richness, seasonal variation, and population trends (Madurapperuma & Amarasinghe 2020). This observation represents an additional documented case of ophiophagy in *Echis carinatus*, providing further insight into its predatory plasticity and interactions within desert ecosystems.

On the night of 6 May 2025, at 21:38, during a scheduled nocturnal reptile survey in the Dubai Desert Conservation Reserve (DDCR), a unique predatory interaction was observed. The site was located on a narrow limestone ridge, with a surrounding habitat comprising a gravel plain mixed with sandy sheets. The area is characterized by sparse vegetation (approximately 10% coverage), predominantly *Leptadenia pyrotechnica* (Apocynaceae), *Arnebia hispidissima* (Boraginaceae), and *Fagonia indica* (Zygophyllaceae). Environmental conditions at the time of observation included a moon phase of 67%, ambient air temperature of 30°C, and relative humidity of approximately 46%.

While surveying within a 50 × 50 m quadrat, a single individual of *Echis carinatus* was sighted near the limestone ridge. The snake initially retreated upon detection but halted approximately 1.5 meters from its original position.

Shortly thereafter, a small reddish snake was seen emerging from a narrow hole in the limestone, later identified as *Myriopholis macrorhyncha*. The identification followed the diagnostic features described by Kamali (2020): total length ~20 cm; an extremely slender, cylindrical, worm-like body; a very short tail ending in a pointed tip; a distinct, beak-shaped snout; greatly reduced eyes; and a uniformly pale-pink body. This species represents the only *Myriopholis* confirmed to occur in the region. The blind snake appeared to struggle significantly while emerging, especially around the cranial region, suggesting possible pre-existing trauma or stress. After several minutes, it successfully exited the limestone crevice and came to rest on the sandy surface (Fig. 1).



Figure 1. *Myriopholis macrorhyncha* emerged from a narrow limestone crevice onto the sandy substrate

A careful examination of tracks revealed that the viper had approached the crevice earlier and had returned to a position only ~6 cm from the emerging blind snake. At this point, two plausible hypotheses were considered: (1) the viper had previously attacked the blind snake during emergence, inflicting injury before retreating due to the observer's presence, or (2) the blind snake was independently injured, perhaps due to trampling by ungulates such as Arabian oryx (*Oryx leucoryx*) or gazelles (*Gazella arabica*, *G. marica*), rendering it vulnerable to opportunistic predation by the viper.

Upon returning after a brief absence of approximately five minutes, the observer found the blind snake had moved ~12 cm across the sand, though it remained visibly injured. It

exhibited abnormal locomotion, was unable to effectively burrow due to head trauma, and propelled itself via undulating motions of the posterior body. The viper remained in proximity, showing focused interest in the injured snake.

The viper eventually seized the blind snake by the neck, initiating ingestion while the prey remained partially active. The ingestion proceeded gradually, starting with a U-shaped loop of the head and upper body (Fig. 2). After approximately 50% of the prey had been swallowed, the observer briefly left the scene again. On final return, the viper was observed resting, and no trace of the blind snake remained, indicating successful consumption.



Figure 2. *Echis carinatus* initiating predation on *Myriopholis macrorhyncha*. The viper is observed gripping the blind snake by the neck region

This record constitutes the first documented case of ophiophagy by *Echis carinatus* on *Myriopholis macrorhyncha*. Although this represents a novel predator–prey interaction, ophiophagy in *E. carinatus* has been previously reported involving *Indotyphlops braminus* (Sharma & Vazirani 1977, Dutta & Teke 2020). Broader dietary studies have shown that *E. carinatus* exhibits an opportunistic feeding strategy, preying on invertebrates, small lizards, and rodents (Whitaker & Captain 2004, Saki *et al.* 2020).

The ecological implications of this observation are significant. Firstly, it expands the known dietary flexibility of *E. carinatus*, suggesting that under certain ecological conditions—such as limited prey availability, injury in potential prey, or rare surface emergence of fossorial species, e.g., during flooding—the species may opportunistically prey on small snakes. Secondly, the observation offers insight into predator–prey interactions in desert ecosystems where surface activity by fossorial species like *Myriopholis* is rare and typically

driven by environmental constraints, such as encountering geological barriers.

Behavioral plasticity in vipers may be more widespread than previously thought, and this rare event emphasizes the value of intensive field monitoring and biodiversity surveys (Gans 1974, Mallow *et al.* 2003). Moreover, such interactions may have been overlooked due to the cryptic behavior of both predator and prey or due to the rapid digestion and destruction of evidence in gut content analyses.

Acknowledgments. I thank the Dubai Desert Conservation Reserve for supporting biodiversity monitoring initiatives and granting access to the study site; the observation was made following the ethical protocols established for wildlife research in the reserve; and Ivan Ineich (Muséum National d'Histoire Naturelle Paris, France) and A.A. Thasun Amarasinghe (BRIN, Indonesia) for reviewing the manuscript.

Literature cited

- Daniels, J.C. (2002). *The Book of Indian Reptiles & Amphibians*. Bombay Natural History Society, Mumbai: 238pp.
- Dutta, A., D.R. Teke (2020). *Echis carinatus carinatus* (Saw-scaled Viper): diet (ophiophagy on *Indotyphlops braminus*). *Herpetological Review*, 51(4): 865–866.
- Egan, D. (2007). *Snakes of Arabia: A Field Guide to the Snakes of the Arabian Peninsula & Its Shores*. Motivate Publishing, Dubai: 208pp.
- Gans, C. (1974). *Biology of the Reptilia, Volume 7: Ecology & Behaviour A*. Academic Press, London: 426pp.
- Kamali, K. (2020). *A Field Guide to the Reptiles and Amphibians of Iran*. Edition Chimaira, Frankfurt am Main. Frankfurt Contributions to Natural History 86, 574pp.
- Madurapperuma, P.L. & A.A.T. Amarasinghe (2020). On a gazelle eating a dove at Dubai Desert Conservation Reserve. *Taprobanica*, 9(2): 242–243.
- Mallow, D., D. Ludwig & G. Nilson (2003). *True Vipers: Natural History & Toxinology of Old-World Vipers*. Krieger Publishing, Florida: 359pp.
- McDiarmid, R.W., J.A. Campbell & T. Touré (1999). *Snake Species of the World: A Taxonomic & Geographic Reference*. Herpetologists' League, Washington D.C.: 511pp.
- Mukherjee, A.K. (2021). Indian Saw-Scaled Viper (*Echis carinatus carinatus*). Pp. 135–144. In: Mukherjee, A.K. (ed). *The "Big Four" Snakes of India: Venom Composition, Pharmacological Properties and Treatment of Envenomation*. Springer Nature Singapore Pte Ltd., Singapore.
- Saki, J., A. Khodadadi, F. Rezaei & A. Dashtaki (2020). Composition of venom and diet in *Echis carinatus sochureki* in Iran. *Iranian Journal of Medical Sciences*, 45(4): 312–319.
- Sharma, R.C. & T.G. Vazirani (1977). Food and feeding habits of some reptiles of Rajasthan. *Records of the Zoological Survey of India* 73(1-4): 77-93.
- Wallach, V., K.L. Williams & J. Boundy (2014). *Snakes of the World: A Catalogue of Living & Extinct Species*. CRC Press, Boca Raton: 1209pp.
- Whitaker, R. & A. Captain (2004). *Snakes of India: Field Guide*. Draco Books, Chennai: 481pp.

Submitted: 16 May 2025, Accepted: 30 October 2025
Subject Editor: Ivan Ineich

P.L. Madurapperuma¹

¹ Dubai Desert Conservation Reserve (DDCR), Dubai,
United Arab Emirates
E-mail: Pubudu.madurapperuma@emirates.com