

Down the mountain: new locality records of the Blunt-nosed Viper (*Macrovipera lebetina*) in Pakistan highlight a previously unrecognized lowland snakebite hazard

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Comprising more than 4200 species, snakes represent one of the most diverse reptile groups (Uetz et al., 2026). In Pakistan, herpetofaunal diversity remains incompletely documented despite the monumental efforts of Khan (2004, 2006a) two decades ago and the increasing number of regional surveys (e.g., Ali et al., 2016; Hamid et al., 2021; Shehzad et al., 2025; Basri et al., 2026). In the most recent summary of Pakistan's herpetofauna, Safi and Karl (2024) reported 83 species of snakes, including eight medically important terrestrial venomous species in the families Elapidae and Viperidae (Khan, 2014; Safi and Karl, 2024; Jablonski et al., 2026).

Published studies from Khyber Pakhtunkhwa, Pakistan's fourth-largest province in the northeastern corner of the country (Fig. 1), collectively indicate the presence of seven medically important venomous snake species (*Bungarus caeruleus*, *Daboia russelii*, *Echis carinatus*, *Gloydius himalayanus*, *Macrovipera lebetina*, *Naja naja*, *N. oxiana*³; Ingoldby and Proctor, 1923; Jamal et al., 2018; Hamid et al., 2021; Shehzad et al., 2025) although no comprehensive checklists at the provincial or district levels are currently available. The only published district-specific information for Nowshera District is about turtles (Khan et al., 2015), while observations of several medically important venomous snake species (*Echis carinatus sochureki*, *Daboia russelii*, *Bungarus caeruleus*, *Naja oxiana*) from recent field surveys in Nowshera have not yet been published.

The Blunt-nosed Viper, *Macrovipera lebetina* (Linnaeus, 1758), is a medically important viper, but its taxonomy has long been considered complex (e.g., Stümpel and Joger, 2009; Oraie et al., 2018; Freitas et al., 2020; Jablonski and Masroor, 2020) and information on its natural history in Pakistan and adjacent regions remains limited to general guides (e.g., Khan, 2002, 2017; Manhas et al., 2018). Although populations in Pakistan had been referred to *M. lebetina turanica* (Chernov, 1939) based on morphology (Jablonski and Masroor, 2020), Avella et al. (2025) presented evidence to support their assignment to *M. lebetina cernovi* (Chikin & Shcherbak, 1992). We here follow Avella et al. (2025) and retain the species epithet *lebetina*, contrary to the opinion of Frétey (2019). The species has a wide range, extending from Cyprus and Asian Türkiye through Central Asia into Pakistan and parts of northeastern India (Jablonski et al., 2025). In Pakistan, the species was historically reported as *Vipera lebetina* from Kaniguram, Waziristan (elevation ca. 2000 m) and as *V. l. obtusa* Dwigubsky, 1832 by Minton (1966), who provided voucher-based records from what was then Balochistan Province in West Pakistan. These were in the historically larger Sibi District from near Kolpur and Ziarat (now in Kachhi and Ziarat District, respectively), with records from elevations between 1000 and 2500 m. However, *M. l. obtusa* is not currently considered to occur in Pakistan (Jablonski and Masroor, 2020), with a range is restricted to western and northwestern Iran (Moradi et al., 2014). Thus, the taxonomic status of *M. lebetina* populations in Pakistan remains unresolved. Khan (2006b) provided a general distributional account of *M. lebetina* for Pakistan, reporting the species from the Waziristan Hills, Quetta Highlands, and the city of Chitral, but without detailed locality data or voucher information.

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³ The record of *Naja haje* published by Younas et al. (2017) is almost certainly referable to *N. oxiana*, based on superficial resemblance. The range of *N. haje* does not extend into Central Asia, and the hood mark in *N. naja* is usually unmistakable.

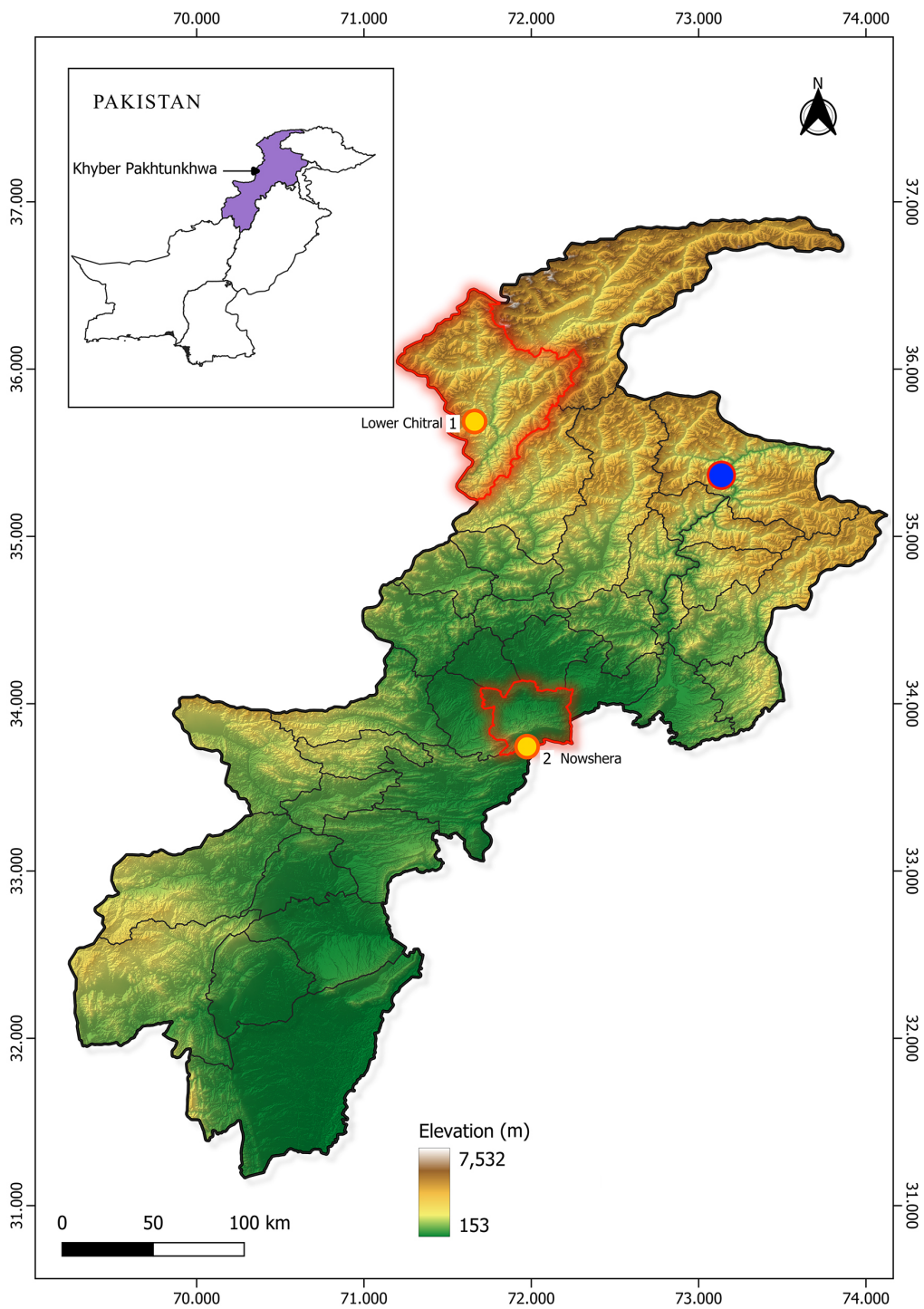


Figure 1. Topographical map of Khyber Pakhtunkhwa Province, Pakistan, showing our new records of *Macrovipera lebetina* (numbered yellow circles) in relation to the closest previously published record (blue circle) reported by Jablonski and Masroor (2020). District boundaries are indicated by black lines, and the districts with our new records are outlined in red. The map clearly shows that the Nowshera District locality is an unexpected lowland site. The inset shows the location of Khyber Pakhtunkhwa Province in northern Pakistan. Map produced by Ayesha Suraweera (via fiverr.com).

A confirmed record was recently reported from the Kaigah Community Game Reserve in Khyber Pakhtunkhwa Province (35.3656°N, 73.1357°E, elevation 2257 m; Fig. 1) by Jablonski and Masroor (2020). No additional verified records of *M. lebetina* from Pakistan have been published since then, but three records exist for the Union Territory of Jammu and Kashmir in India (Sahi and Duda, 1985; Sharma et al., 2008). While multiple photographic records of *M. lebetina* from Nowshera District have been circulated on social media, these records lacked voucher specimens or independently verifiable field data and have been treated as unconfirmed reports. We here present information regarding two additional records for *M. lebetina* in Pakistan.

On 16 May 2025 at 00:20 h a juvenile *M. lebetina* (Fig. 2, inset) was documented in Krakal Village, Bumburet Valley, Khyber Pakhtunkhwa, Pakistan (35.6867°N, 71.6610°E, elevation 2195 m; Fig. 1). The snake was found adjacent to a livestock shelter in close proximity to human habitation (Fig. 2). This record represents a high-elevation occurrence consistent with previously known montane records of the species in

northern Pakistan and lies approximately 138 km to the west of the nearest previously published locality.

On 8 May 2026 at 22:37 h, during a nocturnal herpetological survey we encountered an adult *M. lebetina* (Fig. 3A) near a human guest house in Jungrai Village, Tehsil Nizampur, Nowshera District, Khyber Pakhtunkhwa, Pakistan (33.7439°N, 71.9745°E, elevation 393 m; Fig. 1). The snake was resting beneath stones and exposed roots of Malabar Nut (*Justicia adhatoda*). The surrounding habitat consisted of rocky semi-arid foothills characterized by a gravelly substrate, scattered boulders, and moderate shrub cover interspersed with small trees (Fig. 3B). The area formed a mosaic of open ground and dense vegetation patches, providing a viper with suitable shelter and foraging opportunities. A watercourse was located approximately 100 m from the encounter site. The locality was situated near scattered human settlements and was within 1 km of the main village, highlighting a prominent wildlife-urban interface where the species utilizes rural settlement edges adjacent to its natural foraging grounds. The snake was encountered in microhabitat consistent with ambush predation, potentially positioned to



Figure 2. Juvenile *Macrovipera lebetina* from Krakal, Bumburet Valley, Khyber Pakhtunkhwa Province, Pakistan (inset) in the habitat where it was discovered (elevation 2195 m). Photographs by Mulki Azam.

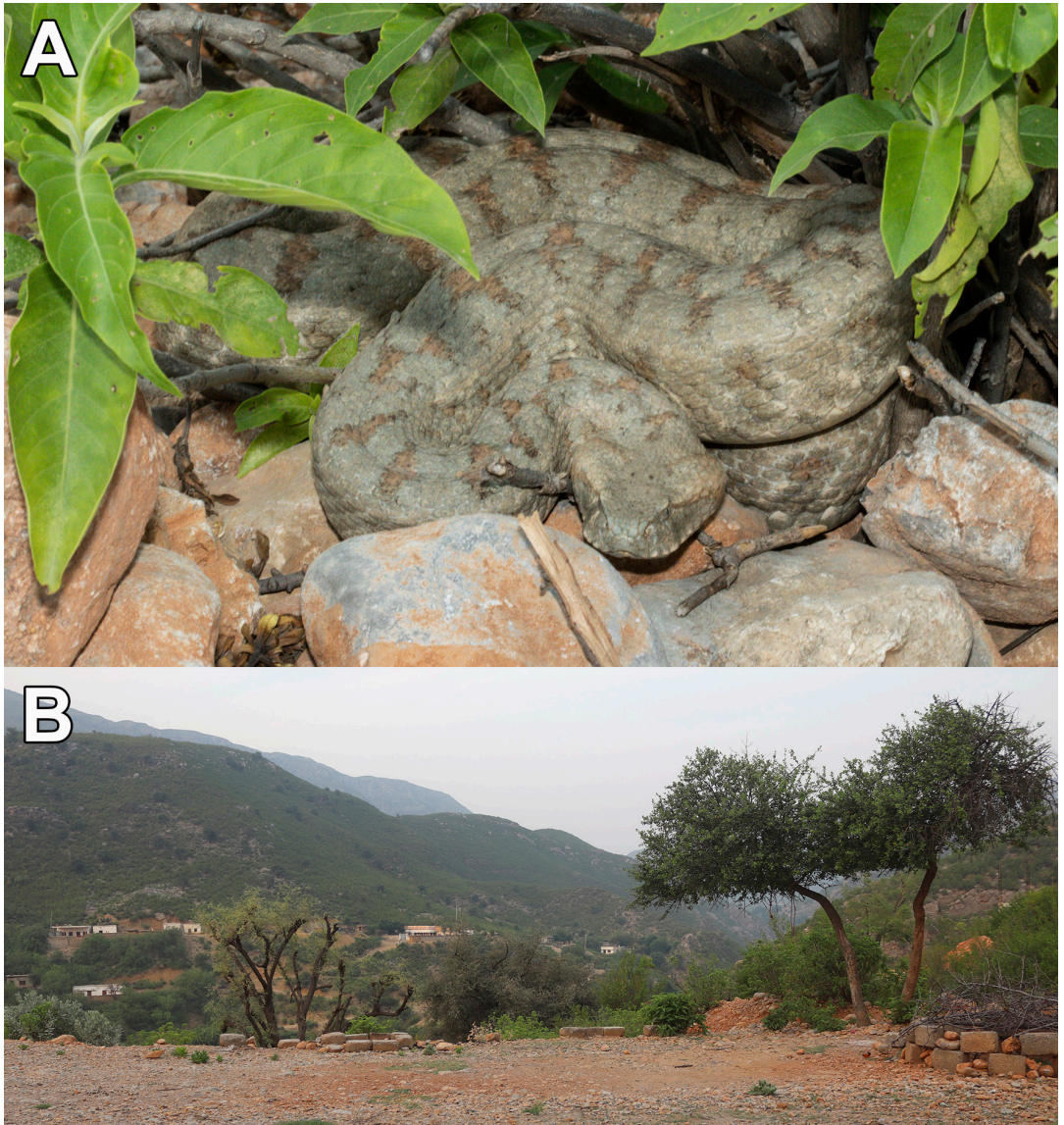


Figure 3. (A) Adult *Macrovipera lebetina* from Jungrai, Nizampur, Nowshera, Khyber Pakhtunkhwa Province, Pakistan. (B) Habitat at the site of encounter (elevation 393 m). Photographs by Mudassar Basri.

exploit rodent movement along vegetated and structural edges. It was observed overnight and photographically documented under natural light conditions the following morning, after which it was photographed and released into suitable habitat nearby within approximately 300 m of the original encounter site. Identification was based on external morphological characters following Minton (1966) and Chikin and Shcherbak (1992), with all characteristics consistent with the diagnostic features of *M. lebetina*.

This record is from a locality approximately 203 km southwest from the nearest previously documented occurrence of the species in Pakistan and 225 km to the west of the nearest documented occurrence in India (Gulmarg, Jammu and Kashmir, elevation 2680 m; Sahi and Duda, 1985). To the best of our knowledge and based on published records, it is also the lowest verified elevation for the species in the Lesser Himalayas. Published records indicate that *M. lebetina* in Pakistan is predominantly associated with montane regions,

and the lowest previous record in the region appears to be the one reported by Sahi and Duda (1985) from “Dachigaon” (likely Dachigam National Park near Srinagar) in Jammu and Kashmir, India, at an elevation of 1895 m (exact coordinates not provided in the original publication). In contrast, the new record from Nowshera District in Pakistan is from an elevation of only 393 m, a substantial downward extension of the known elevational range of the species in the Lesser Himalayas, to a much lower elevation than previously considered. This suggests that the species may occupy a wider range of thermal and habitat conditions, potentially including warmer lowland environments with higher seasonal temperature regimes. Such conditions may influence activity patterns, prey availability, and encounter rates in comparison to higher-elevation populations. The occurrence at a disturbed edge habitat adjacent to a boundary wall further indicates that the species may utilize anthropogenic landscape features that facilitate ambush foraging, particularly where rodent activity is concentrated.

Biogeographically, the new record contributes an additional data point in a region where distributional information for *M. lebetina* remains sparse. Published range maps (e.g., Avella et al., 2025) show only a single confirmed locality point for Pakistan and none for India, and this record helps to partially bridge a distributional gap between northern and western populations. The addition of verified locality data from low elevations is therefore relevant for refining future distribution models of the species.

What makes this single range extension much more significant than the geographic extension is its potential medical relevance. It has been shown that the density of the human population is considerably greater at lower Hindu Kush elevations (Das et al., 2017), which means that snake encounter rates are also expected to be greater at lower elevations. Extending the elevational range of a medically important species such as *M. lebetina*, one of the venomous snakes in Pakistan and northwestern India with snakebite-associated risks (e.g., Khan, 2014; Jamali et al., 2022), into an area of higher population density increases the likelihood of human–snake encounters, particularly in peridomestic environments where rodent prey is abundant. Although there are currently no confirmed envenomation data from this specific locality, there is a report from India (Sharma et al., 2008), and the presence of *M. lebetina* in its newly recognized low-elevation habitat is relevant for local snakebite risk awareness and management strategies in both countries.

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