

## ***Ahaetulla laudankia* and *A. sahyadrensis* (Serpentes: Colubridae): two additions to the ophidiofauna of Maharashtra, India**

Surya Narayanan<sup>1</sup> and Pratyush P. Mohapatra<sup>2,\*</sup>

The vine snake genus *Ahaetulla* Link, 1807 is currently known to comprise 18 species (Mallik et al., 2020; Lam et al. 2021; Uetz et al., 2021), of which 12 are recorded with certainty from India. The presence of a thirteenth species, *A. nasuta* (Lacépède, 1789) has been suggested, but this remains unconfirmed at this time. The recent work on the phylogeny of *Ahaetulla* by Mallik et al. (2020) clarified the taxonomic status of this group and resulted in the descriptions of five new species from the Western Ghats (*A. borealis*, *A. farnsworthi*, *A. malabarica*, *A. sahyadrensis*, *A. travancorica*). These authors also transferred the heretofore widely distributed Indian populations of *A. nasuta* to *A. oxyrhyncha* (Bell, 1825) by restricting the distribution of *A. nasuta* to Sri Lanka. Similarly, earlier records of *A. pulverulenta* (Duméril et al., 1854) from India have been revalidated by the authors under the name *A. sahyadrensis* (*sensu stricto*), given that *A. pulverulenta* was considered to be a Sri Lankan endemic. At this time, two species of *Ahaetulla* have been confirmed from Maharashtra, *A. oxyrhyncha* and *A. borealis* (*sensu* Mallik et al., 2020). Mallik et al. (2020) did not mention any early records of *A. pulverulenta* from Maharashtra, such as the specimens housed in the national zoological collection of the Bombay Natural History Society (BNHS). We herein add two vine snake species to the checklist of reptiles for Maharashtra and provide an updated distribution map for *Ahaetulla* species in the state.

For the purposes of this study, we obtained geographical location data from Google Earth, given that some of the records were not associated with precise GPS coordinates. Observational (research

grade) records for *Ahaetulla* species in Maharashtra were also downloaded from the iNaturalist database (<https://www.inaturalist.org>) and supplemented with literature data and personal observations (Appendix). We collected morphological data for specimens following Mohapatra et al. (2017) supplemented by diagnostic characters from Deepak et al. (2019).

### **Results**

***Ahaetulla sahyadrensis*.** We add *A. sahyadrensis* to the checklist of Maharashtra vine snakes based on BNHS 3404, a specimen collected on the Dajipur-Fonda road, Kolhapur District. Additionally, *A. sahyadrensis* has been observed in Phansad Wildlife Sanctuary (Saunak Pal, pers. comm.) but no voucher specimen is available at this time.

***Ahaetulla laudankia*.** We also add *A. laudankia* Deepak et al., 2019 to the faunal checklist of Maharashtra based on ZSI-WRC-V-1932, a voucher specimen housed in the vertebrate collection of the Western Regional Centre of the Zoological Survey of India (ZSI-WRC-V). Specimen ZSI-WRC-V-1932 was collected on 20 November 1994 by S.S. Kamble at Chitamdeo Point, Melghat Tiger Reserve, Amaravati, Maharashtra (ca. 21.5591°N, 77.3748°E) and accessioned under the name “*Ahaetulla nasuta*.” The specimen superficially resembled *A. laudankia* in having an overall brown colour with black speckles on the head and ventrals. We later confirmed its identity as *A. laudankia* using the diagnostic characters provided by Deepak et al. (2019).

**Description of ZSI-WRS-V-1932 (Fig. 1).** The specimen is a female with the following scale characteristics: 203 ventrals, cloacal plate divided, 156 subcaudals, 15-15-13 dorsal scale rows reducing at the 142nd to 143rd ventral, two postoculars, three preoculars, eight supralabials, nine infralabials, and 1+2+2 temporals. Measurements (in mm) are: snout-to-vent length 563, tail length 305, head length 22.6, head width 7.4, dermal appendage length 2.3,

<sup>1</sup> Suri Sehgal Centre for Biodiversity and Conservation, Ashoka Trust for Research in Ecology and the Environment, Bangalore, Karnataka 560064, India.

<sup>2</sup> Zoological Survey of India, Central Zone Regional Centre, Jabalpur, Madhya Pradesh 482002, India.

\* Corresponding author. E-mail: pratyush.m@zsi.gov.in



**Figure 1.** Plate showing *Ahaetulla laudankia* (ZSI-WRS-V-1932) from Chitmdeo Point, Amravati, Maharashtra, India. The top row shows the specimen in (A) dorsal, (B) ventral, (C) right lateral, and (D) left lateral views. The two remaining images show the specimen in dorsal (E) and ventral (F) views. Scales = 10 mm. Photos by Surya Narayanan.

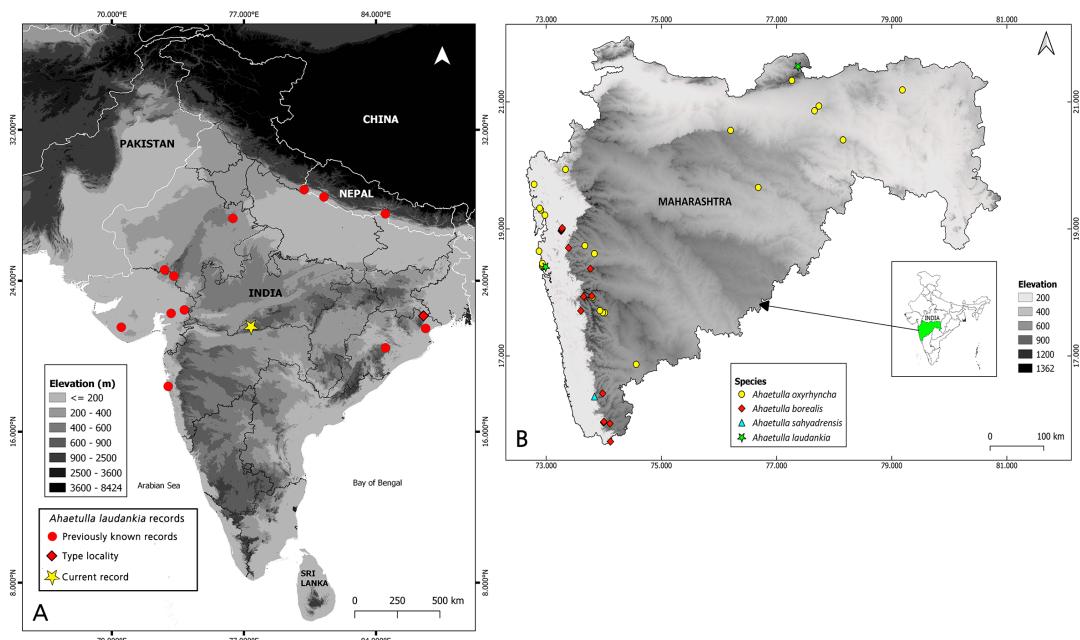
horizontal eye diameter 3.4, eye-to-snout distance 9.5, eye-to-nostril distance 5.0, nostril-to-snout distance 4.1, frontal length 5.1, parietal length 5.2.

## Discussion

*Ahaetulla laudankia* is one of the more poorly known species in the genus *Ahaetulla*. Described only recently from eastern India, this species was initially thought to be endemic to Peninsular India, where it was known only from the states of Odisha and Rajasthan (Deepak et al., 2019). Shortly after publication of its description, other studies reported the presence of *A. laudankia* at previously unknown locations, including Gujarat (Patel et al., 2019), northern Rajasthan (Sengupta and Chandramouli, 2020), Assam (Purkayastha et al., 2021) and from three new locations in Nepal (Rawat et al., 2020), extending the distribution ever further northward. However, the known distribution of *A. laudankia* remains patchy, with almost no records from the central and southern parts of India (Fig. 2).

Before its description, *A. laudankia*, including the type series, had been considered members of the subspecies *A. nasuta isabellinus* (Wall, 1911) (Sclater, 1891; Sharma, 2005; Dutta et al., 2009; Deepak et al.,

2019), but Mallik et al. (2020) raised *A. isabellina* to full species status and restricted its distribution to the Western Ghats. Hence, reports of *A. nasuta isabellinus* from various locations in Peninsular India (e.g., Rao et al., 2011; Walmiki et al., 2012) need verification. *Ahaetulla laudankia* can be differentiated from *A. oxyrhyncha* (*sensu* Mallik et al., 2020) by a higher ventral count of 192–202 (vs. 171–181 in *A. oxyrhyncha*) and a dorsal scale reduction from 15 to 13 rows at 142–147 ventrals (vs. 115–127 in *A. oxyrhyncha*). It can be diagnosed from *A. isabellina* (brown morphs) in having a longer rostral appendage. Although Walmiki et al. (2012) did not provide data on the scale reduction point for *A. nasuta isabellinus*, we provisionally identify records of *A. nasuta isabellinus* as *A. laudankia*, based on the higher ventral counts (192 and 189) of the two female specimens from Phansad Wildlife Sanctuary. The current record of *A. laudankia* is likely the first confirmed record of the species from Maharashtra based on the described voucher specimen. Further field surveys and explorations of other museum collections are warranted which may add to our understanding of the distribution of the poorly known *A. laudankia* and *A. sahyadrensis*.



**Figure 2.** Maps of India (A) and Maharashtra State (B) showing the known distribution of *Ahaetulla laudankia*. In addition, all known records of *Ahaetulla* species are labelled for Maharashtra, with symbols denoting species as follows: *A. oxyrhyncha* (yellow circle), *A. borealis* (red diamond), *A. sahyadrensis* (blue triangle), and *A. laudankia* (green star).

**Acknowledgements.** We thank the Director, Zoological Survey of India and the Officer-in-Charge of ZSI-WRC and ZSI-CZRC for generous support. We thank K.P. Dinesh for support during the visit to ZSI, Pune, and Shubam Adhikari for assistance. Thanks are due to Kedar Bhide and Ashok Captain for the discussion about the distribution of *A. sahyadrensis*; Saunak Pal (BNHS) for sharing personal observations and providing specimen records from the collections; Santosh Bhattarai (NTCN, Nepal) for providing the GPS coordinates of records from Nepal; and Vivek M. Tumsare for sharing GPS coordinates of Chitmadeo Point. We thank Ashok Captain for providing a pre-peer review for this article.

## References

Deepak, V., Narayanan, S., Sarkar, V., Dutta, S.K., Mohapatra, P.P. (2019): A new species of *Ahaetulla* Link, 1807 (Serpentes: Colubridae: Ahaetullinae) from India. *Journal of Natural History* **53**(9-10): 497–516.

Dutta, S.K., Nair, M.V., Mohapatra, P.P., Mohapatra, A.K. (2009): Amphibians and Reptiles of Simlipal Biosphere Reserve. Regional Plant Resource Centre, Bhubaneswar, Orissa, India.

Lam, N.Q., Thu, T.T.A., Nguyen, L.T., Murphy, R.W., Nguyen, S.N. (2021): A new species of *Ahaetulla* Link, 1807 (Squamata: Colubridae) from the Mekong Delta, Vietnam. *Zootaxa* **4966**(3): 290–304

Mallik, A.K., Srikanthan, A.N., Pal, S.P., D’Souza, P.M., Shanker, K., Ganesh, S.R. (2020): Disentangling vines: a study of morphological crypsis and genetic divergence in vine snakes (Squamata: Colubridae: *Ahaetulla*) with the description of five new species from Peninsular India. *Zootaxa* **4874**(1): 1–62.

Mohapatra, P.P., Dutta, S.K., Kar, N.B., Das, A., Murthy, B.H.C.K., Deepak, V. (2017): *Ahaetulla nasuta anomala* (Annandale, 1906) (Squamata: Colubridae), resurrected as a valid species with marked sexual dichromatism. *Zootaxa* **4263**(2): 318–332.

Nande, R., Deshmukh S. (2007): Snakes of Amravati district including Melghat, Maharashtra, with important records of the Indian egg-eater, montane trinket snake and Indian smooth snake. *Zoos’ Print Journal* **22**(12): 2920–2924.

Patel, H., Vyas, R., Vaghshiya, P. (2019): On the distribution of *Ahaetulla laudankia* Deepak, Narayanan, Sarkar, Dutta & Mohapatra, 2019 and *Lycodon travancoricus* (Beddome, 1870) (Squamata, Colubridae) from Gujarat, India. *Check List* **15**(6): 1045–1050.

Purkayastha, J., Bohra, S.C., Tamang, C.B., Medhi, M. (2021): First record of Laudankia Vine Snake, *Ahaetulla laudankia* Deepak, Narayanan, Sarkar, Dutta and Mohapatra 2019, from Assam, India. *Reptiles & Amphibians* **28**(2): 308–309.

Rao, K.T., Ghate, H.V., Sudhakar, M., Javed, S.M.M., Krishna, I.S.R. (2005): Herpetofauna of Nallamalai Hills with eleven new records from the region including ten new records for Andhra Pradesh. *Zoos’ Print Journal* **20**(1): 1737–1740.

Rawat, Y., Bhattarai, S., Poudyal, L., Subedi, N. (2020): Herpetofauna of Shuklaphanta National Park, Nepal. *Journal of Threatened Taxa* **12**(5): 15587–15611.

Slater, W.L. (1891): List of Snakes in the Indian Museum. Calcutta, India, Indian Museum.

Sengupta, D., Chandramouli, S.R. (2020): A new locality record for the recently described Laudankia Vinesnake (*Ahaetulla laudankia*). *Reptiles & Amphibians* **27**(2): 304–305.

Sharma, S.K. (2005): Three records of *Ahaetulla nasuta* var. *isabellinus* from Rajasthan. *Zoos’ Print Journal* **20**(11): 2061.

Uetz, P., Freed, P., Aguilar, R., Hošek, J., Eds. (2021): The Reptile Database. Available at: <http://www.reptile-database.org>. Accessed on 8 June 2021.

Walmiki, N., Karangutkar, S., Yengal, B., Wagh, V., Kumbhar, A., Jadhav, A., Khan, A. (2012): Record of *Ahaetulla nasuta* var. *isabellinus* from Phansad Wildlife Sanctuary Raigad, Maharashtra, India. *Universal Journal of Environmental Research and Technology* **2**(3): 196–198.

**Appendix.** Records of *Ahaetulla* species from Maharashtra State, India, compiled from the literature and online sources

Name	Latitude	Longitude	Source
<i>Ahaetulla borealis</i>	15.652	74.117	<a href="https://www.inaturalist.org/observations/48677348">https://www.inaturalist.org/observations/48677348</a>
	15.935	74.108	<a href="https://www.inaturalist.org/observations/62466793">https://www.inaturalist.org/observations/62466793</a>
	15.952	73.998	<a href="https://www.inaturalist.org/observations/50052004">https://www.inaturalist.org/observations/50052004</a>
	15.960	73.997	<a href="https://www.inaturalist.org/observations/64907459">https://www.inaturalist.org/observations/64907459</a>
	15.960	74.000	<a href="https://www.inaturalist.org/observations/40961595">https://www.inaturalist.org/observations/40961595</a>
	15.965	74.004	<a href="https://www.inaturalist.org/observations/31287757">https://www.inaturalist.org/observations/31287757</a>
	16.411	73.983	<a href="https://www.inaturalist.org/observations/55264491">https://www.inaturalist.org/observations/55264491</a>
	17.711	73.603	<a href="https://www.inaturalist.org/observations/36564186">https://www.inaturalist.org/observations/36564186</a>
	17.933	73.650	<a href="https://www.inaturalist.org/observations/54725843">https://www.inaturalist.org/observations/54725843</a>
	17.945	73.792	<a href="https://www.inaturalist.org/observations/56011736">https://www.inaturalist.org/observations/56011736</a>
	18.376	73.769	<a href="https://www.inaturalist.org/observations/54913394">https://www.inaturalist.org/observations/54913394</a>
	18.701	73.389	<a href="https://www.inaturalist.org/observations/5037357">https://www.inaturalist.org/observations/5037357</a>
	18.968	73.260	<a href="https://www.inaturalist.org/observations/19968080">https://www.inaturalist.org/observations/19968080</a>
	18.981	73.265	<a href="https://www.inaturalist.org/observations/32574576">https://www.inaturalist.org/observations/32574576</a>
	18.989	73.271	<a href="https://www.inaturalist.org/observations/54921809">https://www.inaturalist.org/observations/54921809</a>
	18.990	73.271	<a href="https://www.inaturalist.org/observations/71404105">https://www.inaturalist.org/observations/71404105</a>
	18.993	73.271	<a href="https://www.inaturalist.org/observations/55769940">https://www.inaturalist.org/observations/55769940</a>
	18.995	73.274	<a href="https://www.inaturalist.org/observations/69672624">https://www.inaturalist.org/observations/69672624</a>
	19.015	73.280	<a href="https://www.inaturalist.org/observations/57631242">https://www.inaturalist.org/observations/57631242</a>
<i>Ahaetulla laudankia</i>	18.402	72.990	Walmiki et al., 2012
	20.443	84.503	Deepak et al., 2019
	21.471	86.634	Deepak et al., 2019
	21.537	70.500	Patel et al., 2019
	21.559	77.374	this study
	22.142	86.520	Deepak et al., 2019
	22.270	73.143	Patel et al., 2019
	22.453	73.844	Patel et al., 2019
	24.247	73.285	Sharma et al., 2005
	24.575	72.798	Deepak et al., 2019
	27.302	76.420	Sengupta and Chandramouli, 2020
	27.545	84.498	Rawat et al., 2020
	28.440	81.245	Rawat et al., 2020
	28.825	80.192	Rawat et al., 2020
<i>Ahaetulla oxyrhyncha</i>	16.868	74.563	Pratyush Mohapatra, pers. obs.
	17.680	74.018	<a href="https://www.inaturalist.org/observations/66413354">https://www.inaturalist.org/observations/66413354</a>
	17.683	73.983	<a href="https://www.inaturalist.org/observations/1462784">https://www.inaturalist.org/observations/1462784</a>
	17.715	73.934	<a href="https://www.inaturalist.org/observations/66782535">https://www.inaturalist.org/observations/66782535</a>
	17.923	73.798	<a href="https://www.inaturalist.org/observations/55281299">https://www.inaturalist.org/observations/55281299</a>
	18.405	72.938	<a href="https://www.inaturalist.org/observations/55781676">https://www.inaturalist.org/observations/55781676</a>
	18.412	72.933	<a href="https://www.inaturalist.org/observations/69500598">https://www.inaturalist.org/observations/69500598</a>
	18.435	72.937	<a href="https://www.inaturalist.org/observations/56548265">https://www.inaturalist.org/observations/56548265</a>
	18.459	72.934	<a href="https://www.inaturalist.org/observations/2862691">https://www.inaturalist.org/observations/2862691</a>
	18.611	73.838	Pratyush Mohapatra, pers. obs.
	18.650	72.877	<a href="https://www.inaturalist.org/observations/32856293">https://www.inaturalist.org/observations/32856293</a>
	18.737	73.672	BNHS collections
	19.217	72.978	BNHS collections
	19.299	72.907	<a href="https://www.inaturalist.org/observations/54271213">https://www.inaturalist.org/observations/54271213</a>
	19.327	72.887	<a href="https://www.inaturalist.org/observations/56305768">https://www.inaturalist.org/observations/56305768</a>
	20.403	78.156	Pratyush Mohapatra, pers. obs.
	20.936	77.736	Pratyush Mohapatra, pers. obs.
	21.190	79.187	Pratyush Mohapatra, pers. obs.
	21.317	77.054	Nande and Deshmukh, 2007
<i>Ahaetulla sahyadrensis</i>	16.361	73.840	BNHS collections