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On the distribution of *Myriopholis macrorhyncha* (Jan, 1860) (Squamata, Serpentes, Leptotyphlopidae) from India, with comments on the occurrence of members of Family Leptotyphlopidae from India.

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ABSTRACT. We confirm the presence of *Myriopholis macrorhyncha* (Jan, 1860) from India, based on reptile surveys conducted in north Gujarat and Saurashtra regions of Gujarat state. We also discuss the historical records of the family Leptotyphlopidae from the country. The study also provides new information on the morphology and microhabitat of the species.

KEYWORDS. Thread snakes, species distribution, Scolecophidia, morphology, taxonomy

Introduction

Scolecophidians are small, burrowing, worm-like snakes with rudimentary vision. Most species of this group have greatly reduced eyes and less flexible head scalation, are pinkish or brownish in colouration, usually unicoloured or bicoloured tubular-shaped body with subequal, smooth scales, and are frequently mistaken for earthworms by laymen. All scolecophidians actively feed on small social insects (ants and termites) and their larvae (Cundall & Greene 2000). They include the world's smallest snakes and rarely exceed 30 cm in length (Hedges 2008). Although largely neglected in vertebrate research, being basal to other serpents, knowledge on their biogeographical history is crucial for evaluating hypotheses on the origin of serpents (Vidal et al. 2010). The superfamily Typhlopoidea (Scolecophidia) contains some 463 species, which is further divided into five families: Anomalepididae (21 species), Gerrhopilidae (23 species), Typhlopidae (275 species), Xenotyphlopidae (2 species) and Leptotyphlopidae (142 species) (Uetz et al. 2022). However, a recent phylogenetic study proposed a division of Scolecophidians into two superfamilies: Typhlopoidea (blind snakes) and Leptotyphlopoidea (thread snakes). It excluded the family Anomalepididae from Scolecophidia as they were phylogenetically more closely related to 'typical snakes' (Miralles et al. 2018).

The family Leptotyphlopidae Stejneger, 1892, is among the most poorly known groups of all terrestrial vertebrates from the standpoint of systematics and ecology (Adalsteinsson et al. 2009). Members of this group are among the thinnest and smallest snakes, and they are commonly known as 'thread snakes.' Leptotyphlopids have a West Gondwanan distribution, occurring primarily in Asia, Africa and the Ne-

otropics (South America, Middle America, and the West Indies). They occupy a wide variety of habitats and elevations, occurring in deserts (Branch 1998; Broadley & Wallach 2007), forests (Broadley & Wallach 1997), wetlands, savannahs (Broadley & Broadley 1999; Broadley & Wallach 2007), and transformed habitats (Thomas et al. 1985), from below sea level to 3250 meters (Thomas et al. 1985; Zug 1977). Some leptotyphlopids occur on islands that were never connected to mainland areas, hinting at a trans-marine dispersal mode (Adalsteinsson et al. 2009). Adalsteinsson et al. (2009) further classified the family into two sub-families: Epictinae (distribution- new and old world, relatively short-tailed: contains 10 genera, and 89 species) and Leptotyphlopinae (distribution-old world relatively long-tailed; four genera, and 53 species) (Uetz et al. 2022).

Myriopholis is a diverse genus with 24 recognized species, distributed throughout Africa (north and south of the Sahara Desert), the Arabian Peninsula and Socotra Island, and southwest Asia (Turkey, Iran, Pakistan, and northwest India) (Adalsteinsson et al. 2009). *Myriopholis macrorhyncha* was originally described by Jan in 1860 as *Stenosoma macrorhynchum* from 'Sennaar' (now in Sudan) (Jan 1860). This is the most widely distributed leptotyphlopid (Adalsteinsson et al. 2009). It is reported from the African to the Arabian Peninsula, Middle East and southwest Asia (Uetz et al. 2022). However, the exact distribution of this species needs a reassessment, since several records of this species have recently been attributed to other species as a result of taxonomic reassessments of certain populations, leading to description of new species as well as revalidation of synonymized taxa (Venchi & Sindaco 2006).

The published literature indicates that *Myriopholis macrorhyncha* was reported from Sind in British India (now in Pakistan) (Boulenger 1890a, 1893; Gharpurey 1937; Smith 1943). Further, Minton (1966), Khan (2006), Baig et al. (2008) and Masroor (2012) added new information on the species and new distribution records from Pakistan. The species was included in the list of Indian snakes by some (Hahn 1978; Das 1994), but not all (Deoras 1965; Whitaker 1978; Murthy 1985; Whitaker & Captain 2004; Aengals et al. 2018). Similarly, the species was included in the list of snake fauna of Rajasthan by some (Patel et al. 2021), but not all (Bhatnagar et al. 2013). Thus, occurrence of this leptotyphlopid in India has been a question of debate. Here, we confirm the occurrence of *Myriopholis macrorhyncha* in India based on new material collected from Gujarat. Further, we discuss the occurrence of other members of family Leptotyphlopidae from India.

Materials and methods

The present study is based on three specimens collected during our ongoing survey to document the herpetofauna of Gujarat, with permissions issued by the Forest Department of Gujarat state (permit numbers WZP/5585/22/C/590-92/3-8-1990, B/WPS/8/9388-92/2013-14 and WPS/T4/682/B/2931/2016-17) and in accordance with the Indian Wild Life (Protection) Act 1972. The specimens were euthanized with halothane, fixed in 4% formaldehyde, and later transferred to 70% ethanol and deposited in the collections of the Bombay Natural History Society (BNHS), Mumbai (BNHS 3661, BNHS 3662 and BNHS 3663). The pholidosis and morphometric data of all the specimens are given in Table 1. The study also includes two live specimens (field numbers: RVT 01 and RVT 02) that were photographed, examined, and released at the capture site in a few days.

Mensural, meristic and qualitative data were recorded by following Broadley & Wallach (2007). All pholidotic features were examined using a stereo microscope (Omano OM2360-BL). Morphological measurements like snout-vent lengths (SVL), tail lengths (TaL) and total lengths (TL), were measured to the nearest millimetre using a non-elastic string and a ruler. The number of scales around the body were counted at mid-body and the scales around the tail were counted near the cloaca. The total number of dorsal scales between the rostral shield and the terminal spine were counted as the total middorsal scales. Subcaudal counts reported here do not include the terminal scute. Description style follows Broadley & Wallach (2007) with some modifications (Patel et al. 2019a).

Collection abbreviations: BNHS, Bombay Natural History Society, Mumbai, India; NHMUK, Natural History Museum, London,

United Kingdom; MCZ, Museum of Comparative Zoology, Massachusetts, United States.

Results

Taxonomic accounts

Order: Squamata

Family: Leptotyphlopidae

Genus: *Myriopholis* Hedges, Adalsteinsson & Branch, 2009

Myriopholis macrorhyncha (Jan, 1860)

(Figure 1, 2, 3; Table 1)

Stenosoma macrorhynchum Jan, 1860

Glauconia macrorhynchus Boulenger, 1890a, 1893

Leptotyphlops macrorhynchus Smith, 1943

Myriopholis macrorhyncha Adalsteinsson et al. 2009; Patel et al. 2021

Common name. Long-nosed Worm Snake

Material examined: BNHS 3661, unsexed adult, from Zat-Satsan (24.5155°N 72.3613°E; ca. 209 m a.s.l.), Banaskantha district, Gujarat, India, collected by Raju Vyas, Harshil Patel and Vaibhav Naik on 29 September 2021; BNHS 3662 (Fig. 1), unsexed adult, from near Bhimrana (22.3610°N 68.9649°E; ca. 6 m a.s.l.), Devbhoomi Dwarka district, Gujarat, India, collected by Vivek Sharma on 14 October 2016; BNHS 3663, unsexed adult, from Gadhechi (21.7580°N 72.1122°E; ca. 28 m a.s.l.), Bhavanagar city, Bhavanagar district, Gujarat, India, collected by Raju Vyas and Deepak Makawana in August 1982; RVT 01, unsexed adult, from near Bhanvad (21.9499°N 69.7641°E; ca. 48 m a.s.l.), Devbhoomi Dwarka district, Gujarat, India, examined by Raju Vyas on 21 March 2018; RVT 02, unsexed adult, from near Rajula (21.0083°N 71.4903°E; ca. 11 m a.s.l.), Amreli district, Gujarat, India, examined by Raju Vyas in October 2019.

Morphology and description: Body long, thin and cylindrical, with head and neck slightly broader than the body, short tail tapers to a small terminal spine. Body covered with smooth, imbricate and subequal scales in 14 rows, which reduce to 10 rows near the cloaca and on the tail; precloacal shield semilunate; total mid-dorsals 374–438 (315–404 fide. Broadley & Wallach 2007); subcaudals 45–55 (26–43 fide. Broadley & Wallach 2007). Snout hooked in lateral view with a distinct beak, rostral wide, much wider than nasals, not reaching level of eyes; nasal divided into a large upper supranasal and a small lower infranasal; upper lip covered by infranasal, anterior supralabial, ocular, and posterior supralabial; anterior supralabial small, as wide as infranasal; ocular large, with moderate rounded black eyespot centrally placed in the upper half; posterior supralabial moderate. Nostril midway between rostral and anterior supralabial along nasal suture. Frontal and supraoculars subequal, postfrontal subpentagonal or semicircular; supraoculars anteriorly wedged between supranasal and ocular, posteriorly wedged between frontal and postfrontal, both smaller than interparietal and interoccipital; parietals transverse, slightly larger than the occipitals, in contact with posterior supralabials; single temporal; mental absent, four infralabials (Figure 3).

Colouration. Dorsal ground colour of live individual pinkish; a blotch in a shade of lighter pink on the neck and nape, a similar band is sometimes present in the anterior half of the body; underside light pink to white and forms an uneven zig-zag border with upper body colouration on flanks.

Distribution. The present study records this species from Banaskantha district in north Gujarat and Bhavnagar, Devbhoomi Dwarka and Amreli districts in the Saurashtra region (Figure 4).

Habit, Habitat and Natural History. All individuals were found during the daytime or late evening, under rocks or decaying logs while conducting surveys in semiarid regions (Figure 5). The animals were found under rocks and logs that were of a moderate size, not deeply embedded in the ground, and which bore cavities beneath, where these snakes sheltered. Soil was made of a mixture of dry clay, sand, and decaying organic material. Other reptiles reported from same habitats were *Echis carinatus* (Schneider, 1801), *Psammophis leithii* Günther 1869, *Eryx johnii* (Russell, 1801), *Acanthodactylus cantoris* Günther 1864, *Ophisops* sp., *Hemidactylus* sp. and *Indotyphlops* sp. The specimen BNHS 3662 was found in saline scrubland, hardly 600 m away from the coastline. All the localities were in scrublands, either in the coastal regions or in arid regions, except for one (BNHS 3663) found in a home garden.

Table 1. Scale counts and measurements (mm) of specimens of *Myriopholis macrorhyncha* from Gujarat, India.

Specimen	BNHS 3661	BNHS 3662	BNHS 3663	RVT 01	RVT 02
Location	Zat-Satsan, Banaskantha	Bhimrana, Devbhoomi Dwarka	Desai Nagar, Gad-hechi, Bhavanagar	Bhanvad, Devbhoomi Dwarka	Rajula, Amreli
Habitat	Scrub forest	Coastal scrubland	Kitchen Garden	Scrubland	Scrubland
TL	142	140	180	155	160
SVL	130	129	162	138	-
TaL	12	11	18	17	-
Scales around the body	14	14	14	14	14
Scales around the tail	10	10	10	-	-
Mid-dorsals	438	413	410	374	421
Subcaudal	55	-	53	45	-

**TL: total lengths, SVL: snout-vent lengths and TaL: tail lengths.*

Figure 1. *Myriopholis macrorhyncha* (BNHS 3662) from Devbhoomi Dwarka, Gujarat (A) dorsal view; (B) Head dorso-lateral and (C) Head dorsal (Photos by Vivek Sharma).

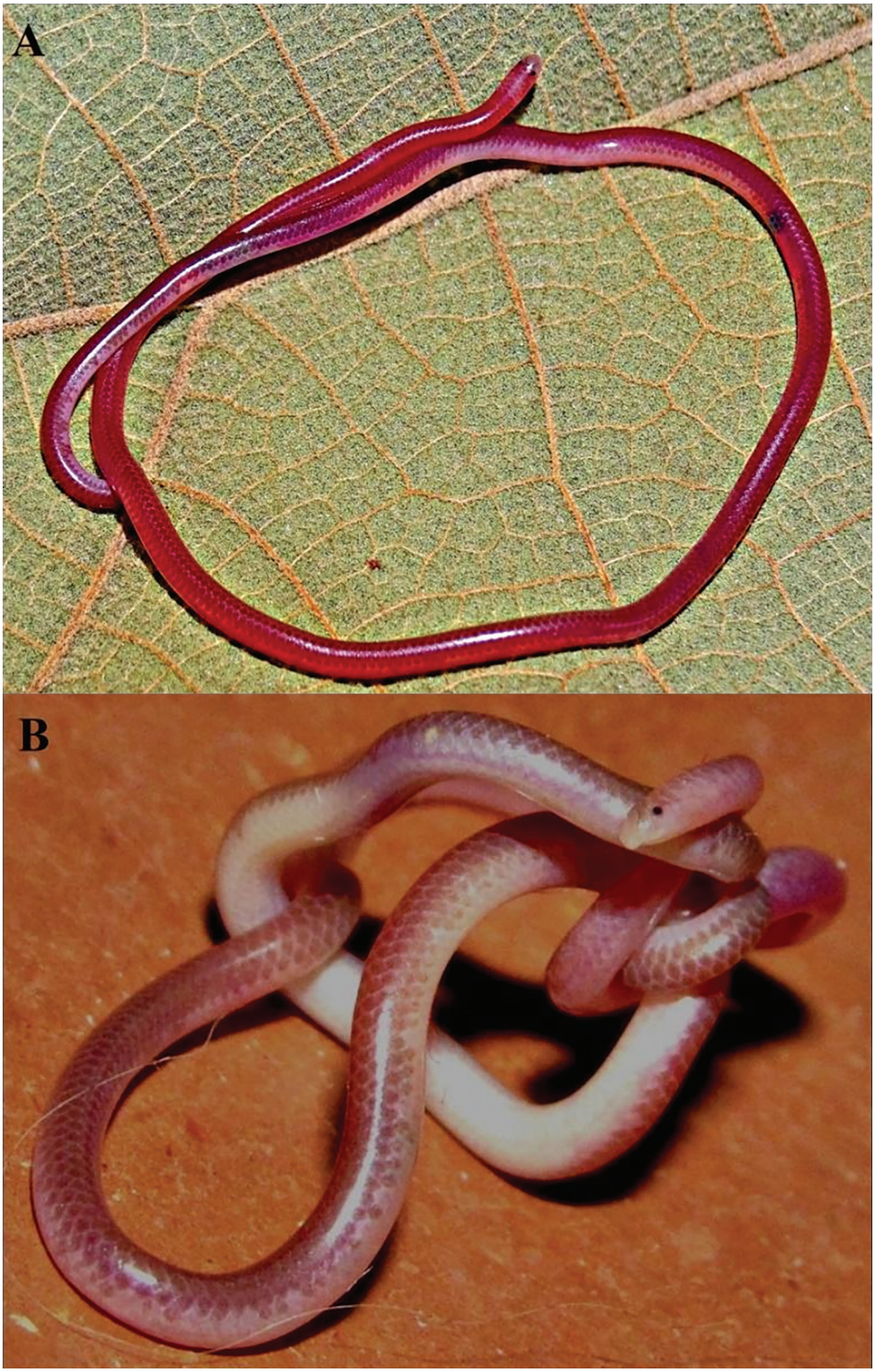

Figure 2. Uncollected vouchers of *Myriopholis macrorhyncha* from Gujarat (A) RVT 01 from Bhanvad, Devbhoomi Dwarka, Gujarat; (B) RVT 02 from Rajula, Amreli, Gujarat (Photos by Raju Vyas).

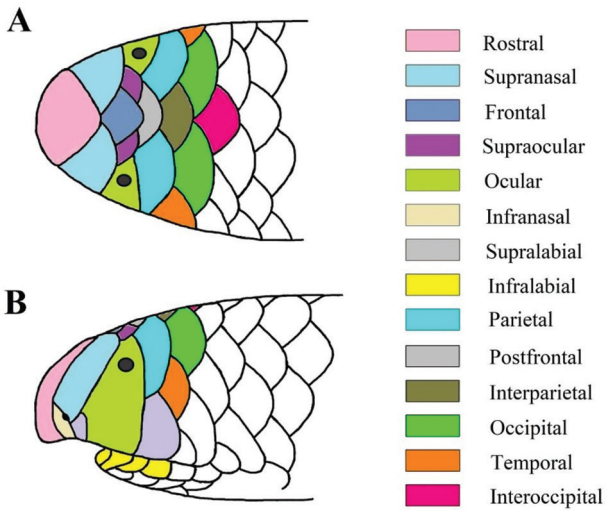

Figure 3. Schematic representation of head scalation of *Myriopholis macrorhyncha* (BNHS 3663) (A) Head dorsal and (B) Head lateral.

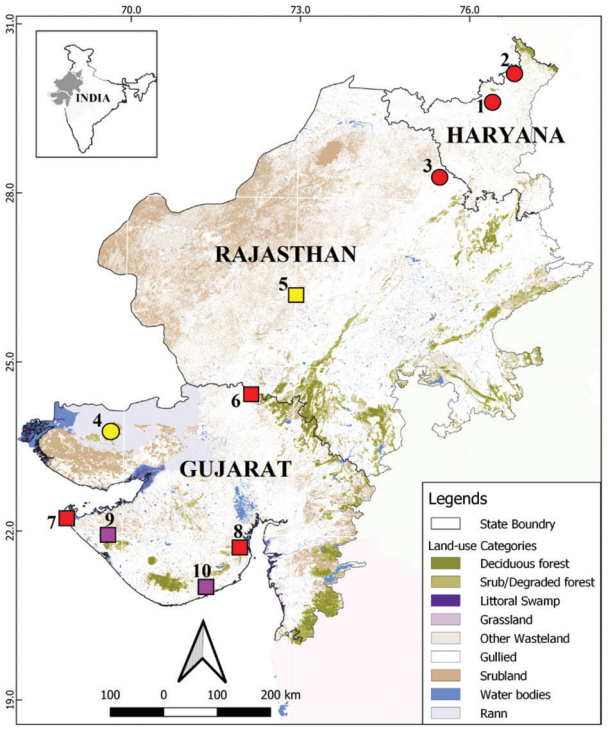

Figure 4. Map of Western India showing locations from where *Myriopholis blanfordi* (circles) and *Myriopholis macrorhyncha* (squares) were reported in India (red fill: locations from where museum vouchers were originated; purple fill: locations from where photo vouchers were originated; yellow fill: locations reported in literature without details of voucher specimens, need further verification); see Appendix 1 for details of locations.

Discussion

Two members of the family Leptotyphlopidae, namely, *Myriopholis blanfordi* (Boulenger, 1890) and *M. macrorhyncha* are reported in literature (both pre-independent and post-independent India) as inhabiting India (Gray 1845; Günther 1869; Boulenger 1890a, 1890b, 1893; Smith 1943; Sharma 2007).

During the pre-independence period in India, *M. blanfordi* was described from Sind (now in Pakistan) and subsequently reported from Multan (now in Punjab, Pakistan) and from Ambala (now in Haryana, India); whereas *M. macrorhyncha* was recorded from Karachi (now in Sind, Pakistan) (Boulenger 1890a; Smith 1943). Later, both the species were included in the list of serpents of India or arid regions of the country (Hahn 1980; Das 1994; Patel et al. 2021). Later, *M. blanfordi* was reported from a few localities in Rajasthan (Sundersingh 1960; Murthy et al. 1993) and one location (Kavada, Kutch) in Gujarat (Sharma 2007); and *M. macrorhyncha* was reported from Jodhpur, Rajasthan (Sharma 2007). However, no voucher specimens or morphological details for the post-independence reports were provided. Records of *M. blanfordi* from India is accepted by few researchers (Whitaker & Captain 2004; Aengals et al. 2018). Thus, the present communication is noteworthy, given that this is the first authentic report of *M. macrorhyncha* from India.

The present study shows that *M. macrorhyncha* is widely distributed in Gujarat State, and could also be occurring in the western Indian state of Rajasthan (Fig. 4). However, surveys thus far had not reported this species from Gujarat (Acharya 1949; Kapadia 1951; Sharma 1982, 2000; Vyas, 1993, 1998, 2000, 2007; Gayen 1999; Patel & Vyas 2019). With these new records of *M. macrorhyncha*, which is the first authentic record of Family Leptotyphlopidae from the state, the total number of snake species in Gujarat is now 58 (Pa-

Figure 5. Habitat of *Myriopholis macrorhyncha* (A) at Zat-Satsan, Banaskantha, Gujarat and (B) near Bhimrana, Denbhoomi Dwarka, Gujarat [Photos by Raju Vyas (A) and Harshil Patel (B)].

tel & Vyas 2019; Patel et al. 2019a & 2019b). The sole record of *M. blanfordi* from Khavada (in Kutch), Gujarat by Sharma (2007) needs further confirmation (see Patel & Vyas 2019). Records of members of the family Leptotyphlopidae from India are presented in Appendix 1 and Figure 4. In addition to these reports, we received images of three thread snakes from the

Saurashtra region (one each from Bhavnagar, Beyt Dwarka and Veraval). The images were sent by naturalists and snake rescuers, and appear to be the members of the genus *Myriopholis*. However, lack of specimens hindered species identification.

M. macrorhyncha, being a wide-ranging species spanning from African to Arabian Peninsula, Middle East and southwest Asia (Uetz et al. 2022), could be a species complex comprising multiple lineages. The present records are the eastern most population of the species. The eastern population of *M. macrorhyncha* was described as *Glauconia hamulirostris* Nikolsky, 1907, with its type locality in Iran, which is usually treated as a subjective synonym by most researchers (Smith 1943; Broadley & Wallach 2007; Adalsteinsson et al. 2009; Sharma 2007). However, Hahn (1980) and Wallach et al. (2014) considered it as a valid taxon. Molecular and morphological studies are required to clarify the status of *Glauconia hamulirostris*. Until then, it should be treated as a synonym of *M. macrorhyncha*. A thorough revision and reassessment involving detailed morphological comparisons, aided with molecular data from samples throughout the range of *M. macrorhyncha*, is needed to resolve this species complex.

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References

ACHARYA, H. (1949) List of reptiles of Gujarat state. *Prakruti*, 8, 156–178.

ADALSTEINSSON, S.A., BRANCH, W.R., TRAPE, S., VITT, L. J. & HEDGES, S. B. (2009) Molecular phylogeny, classification, and biogeography of snakes of the family Leptotyphlopidae (Reptilia, Squamata). *Zootaxa* 2244, 1–50. https://doi.org/10.11646/zootaxa.2244.1.1

AENGALS, R., SATHISHKUMAR, V.M., PALOT, M.J. & GANESH, S.R. (2018) A Checklist of Reptiles of India. 35 pp. Version 3.0. Available from: www.zsi.gov.in

BAIG, K.J., MASROOR, R. & ARSHAD, M. (2008) Biodiversity and ecology of the herpetofauna of Cholistan desert, Pakistan. *Russian Journal of Herpetology*, 15(3), 193–205. https://doi.org/10.30906/1026-2296-2008-15-3-193-205

BHATNAGAR, C., SHARMA, S.K., MATHUR, M., & SHARMA, B.K. (2013) Ophidians of Rajasthan. *In*. (Eds.). B.K. Sharma, Seema Kulshreshtha & Asad R. Rahmani. *Faunal Heritage of Rajasthan, India General Background and Ecology of Vertebrates*. Springer New York Heidelberg Dordrecht London, pp. 311–330.

BOULENGER, G.A. (1890A) *Fauna of British India, including Ceylon and Burma: Reptilia and Batrachia*. Taylor & Francis, London, 541 pp.

BOULENGER, G.A. (1890B) Description of a new snake of the Genus *Glauconia* Gray, obtained by Dr. Emin Pasha on the Victoria Nyanza. *Annals of the Magazine of Natural History*, 6, 91–93.

BOULENGER, G.A. (1893) *Catalogue of snakes in the British Museum (Natural History). Vol. 1.* Longmans and Company, London, 448 pp.

BRANCH, W.R. (1998) *A Field Guide to the Snakes and other Reptiles of Southern Africa*. Struik, Capetown, 326 pp.

BROADLEY, D.G. & BROADLEY, S. (1999) A review of the African wormsnakes from south of latitude 12° S (Serpentes: Leptotyphlopidae). *Syntarsus*, 5, 1–36.

BROADLEY, D.G. & WALLACH, V. (1997) A review of the genus Leptotyphlops (Serpentes: Leptotyphlopidae) in Kwazulu–Natal, with the description of a new forest–dwelling species. *Durban Museum Novitates*, 22, 37–42.

BROADLEY, D.G. & WALLACH, V. (2007) A revision of the genus Leptotyphlops in northeastern Africa and southwestern Arabia (Serpentes: Leptotyphlopidae). *Zootaxa*, 1408, 1–78. https://doi.org/10.11646/ZOOTAXA.1408.1.1

CUNDALL, D. & GREENE, H.W. (2000) Feeding in snakes. *In*: Schwenk, K. (Ed.) *Feeding, Form, Function, and Evolution in Tetrapod Vertebrates*, San Diego, pp. 293–333.

DAS, I. (1994) The reptiles of south Asia, checklist and distributional summary. *Hamadryad*, 19, 15–40.

DEORAS, P.J. (1965) *Snakes of India*. National Book Trust, New Delhi. 144pp.

GAYEN, N.C. (1999) A synopsis of the reptiles of Gujarat, western India. *Hamadryad*, 24, 1–22.

GHARPUREY, K.G. (1937) *Snakes of India*. Popular Book Depot, Bombay, 156 pp.

GRAY, J.E. (1845) *Catalogue of the Specimens of Lizards in the Collection of the British Museum.* London, xxviii+289 pp.

GÜNTHER, A. (1869) Report on two collections of Indian reptiles. *Proceedings of the Zoological Society of London*, 500–507.

HAHN, D.E. (1978) Brief review of the genus *Leptotyphlops* (Reptilia, Serpentes, Leptotyphlopidae) of Asia, with description of a new species. *Journal of Herpetology*, 12, 477–489.

HAHN, D.E. (1980) Liste der rezenten Amphibien und Reptilien: Anomalepididae, Leptotyphlopidae, Typhlopidae. *Das Tierreich, Berlin*, 101, 1–93.

HEDGES, S.B. (2008) At the lower limit of size in snakes: two new species of thread snakes (Squamata: Leptotyphlopidae: Leptotyphlops) from the Lesser Antilles. *Zootaxa*, 1841, 1–30. https://doi.org/10.11646/zootaxa.1841.1.1

JAN, G. 1860. *Iconographie generale des Ophidiens. Tome premier (livrais. 1 à 17), contenant centdeux planches.* J. B. Baillière et Fils, Paris, pp. 1–11, Pls. 1–102.

KAPADIA, G.A. (1951) *Animal List of Mahagujarat*. Bombay, India, Gujarat Research Society. 18 pp.

KHAN, M.S. (2006) *Amphibians and reptiles of Pakistan*. Kreiger Publishing Company, Malabar, Florida, 311 pp.

MASROOR, R. (2012) *A Contribution to the Herpetology of Northern Pakistan: The amphibians and reptiles of Margalla Hills National Park and surrounding regions.* Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA, 217p

MINTON, S.A.JR. (1966) A contribution to the herpetology of West Pakistan. *Bulletin of the American Museum of Natural History*, 134, 29–184.

MIRALLES, A., MARIN, J., MARKUS, D., HERREL, A., HEDGES, S.B., & VIDAL, N. (2018) Molecular evidence for the paraphyly of Scolecophidia and its evolutionary implications. *Journal of Evolutionary Biology*, 31, 1782–1793. https://doi.org/10.1111/jeb.13373

MURTHY, T.S.N. (1985) Classification and distribution of the reptiles of India. *The Snake*, 17, 48–71.

MURTHY, T.S.N., SANYAL, D.P., & DUTTAGUPTA, B. (1993) Rare snakes of India. *The Snake*, 25, 135–140.

PATEL, H. & VYAS, R. (2019) Reptiles of Gujarat, India: Updated Checklist, Distribution and Conservation Status. *Herpetology Notes*, 12, 765–777.

PATEL, H., VYAS, R. & VAGHASHIYA, P. (2019A) 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. https://doi.org/10.15560/15.6.1045.

PATEL, H., VYAS, R. & DUDHATARA, B. (2019B) *Dendrelaphis caudolineatus* (Gray, 1834) (Squamata: Colubridae) from India? *Zootaxa*, 4571(2), 278–280. http://dx.doi.org/10.11646/zootaxa.4571.2.9

PATEL, H., GUPTA, G., CHANDRA, K., RAGHUNATHAN, C. & KUMAR, S. (2021) Chapter 11, Chordata: Vertebrata. 135-156. *In*. (Eds.) Chandra, K., Gupta, D., Raghunathan, C., Kumar, S. and Saini, J., 2021. *Faunal Diversity of Biogeographic Zones of India: Deserts*, Zoological Survey of India, Kolkata, 1-158.

SHARMA, R.C. (1982) Taxonomic and ecological studies on the reptiles of Gujarat. *Records of the Zoological Survey of India*, 80, 85–106.

SHARMA, R.C. (2000), Reptilia. *In*: *Fauna of Gujarat (Part 1). Vertebrates*, Alfred, J.R.B., Ed., Kolkata, India, Zoological Survey of India. pp. 243–298.

SHARMA, R.C. (2007) *The Fauna of India and Adjacent Countries. Reptilia. Volume III (Serpentes)*. Kolkata, India, Zoological Survey of India.

SMITH, M.A. (1943) *The Fauna of British India, Ceylon and Burma, Including the Whole of the Indo-Chinese Sub-Region. Reptilia and Amphibia. 3 (Serpentes)*. Taylor and Francis, London. 583 pp

SUNDERSINGH P.P.H. (1960) Reptilian fauna of Pi-

lani with a note on the food contents, Pt.I. Ophidia. *Proceeding Rajasthan Academic Science*, 7, 52–59.

THOMAS, R., MCDIARMID, R.W. & THOMPSON, F.G. (1985) Three new species of thread snakes (Serpentes, Leptotyphlopidae) from Hispaniola. *Proceedings of the Biological Society of Washington*, 98, 204–220.

UETZ, P., FREED, P., & HOŠEK, J. (2022). The Reptile Database. https://www.reptile-database.org (Date of access: 26th January 2022).

VENCHI, A. & SINDACO, R. (2006) Annotated checklist of the reptiles of the Mediterranean countries, with keys to species identification. Part 2 -Snakes (Reptilia, Serpentes). *Annali del Museo Civico di Storia Naturale "G. Doria"*, *Genova,* XCVIII: 259–364.

VIDAL, N., MARIN, J., MORINI, M., DONNELLAN, S., BRANCH, W.R., THOMAS, R., VENCES, M., WYNN, A., CRUAUD, C. & HEDGES, S.B. (2010) Blind Snake evolutionary tree reveals long history on Gondwana. *Biology Letters*, 6, 558–561. https://doi.org/10.1098/rsbl.2010.0220

VYAS, R. (1993) *Studies on some snakes (Ophidia- Reptilia) of Gujarat State, India.* Unpublished Ph. D. Dissertation, Bhavnagar University, Bhavnagar. 187 pp.

VYAS, R. (1998) The reptiles of Gujarat: updated distribution. *Tigerpaper*, 25(1), 8–14.

VYAS, R. (2000) A review of reptile studies in Gujarat state. *Zoos' Print Journal*, 15, 386–390.

VYAS, R. (2007) Present conservation scenario of Reptile fauna in Gujarat state, India. *Indian Forester,* 133, 1381–1394.

WALLACH, V., WILLIAMS, K.L., & BOUNDY, J. (2014) *Snakes of the World: A Catalogue of Living and Extinct Species*. Taylor and Francis, CRC Press, 1237 pp.

WHITAKER, R. & CAPTAIN, A. (2004) *Snakes of India - The field guide*. Draco Books, Chennai, India. xiv+ 481 pp.

WHITAKER, R., (1978) *Common Indian Snakes - A field Guide*. Macmillan India Ltd., Delhi. 154 pp.

ZUG, G.R. (1977) Distribution and variation of *Leptotyphlops tricolor*. *Copeia*, 1977, 744–745.

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Appendix 1. Records of members of family Leptotyphlopidae from India, in correspondence with Figure 4.

	Species	Name of Locality	Geo-coordinates	Voucher No.	Source
1	*Myriopholis blanfordi*	from the Plains 70 miles SW of Ambala[1] (in Haryana, India)	29.6278°N; 76.1392°E	MCZ:Herp:R-3749	Barbour 1908
2	*Myriopholis blanfordi*	Umballah N India[2] (Ambala, Haryana, India)	30.3609°N; 76.7978°E	MCZ:Herp:R-3217	Barbour 1908
3	*Myriopholis blanfordi*	Umballah N India[2] (Ambala, Haryana, India)	30.3609°N; 76.7978°E	MCZ:Herp:R-3218	Barbour 1908
4	*Myriopholis blanfordi*	Umballah N India[2] (Ambala, Haryana, India)	30.3609°N; 76.7978°E	MCZ:Herp:R-175103	Barbour 1908
5	*Myriopholis blanfordi*	Pilani, Rajasthan[3]	28.3813°N; 75.6139°E	NHMUK:1957.1.9.7	
6	*Myriopholis blanfordi*	Khavada, Kutch, Gujarat[4]	23.8439°N; 69.7340°E	-	Sharma 2007
7	*Myriopholis macrorhyncha*	Jodhpur, Rajasthan[5]	26.2515°N; 72.9934°E	-	Sharma 2007
8	*Myriopholis macrorhyncha*	Zat-Satsan, Banaskantha, Gujarat[6]	24.5155°N; 72.3613°E	BNHS 3661	Present Study
9	*Myriopholis macrorhyncha*	Bhimrana, Devbhoomi Dwarka, Gujarat[7]	22.3610°N; 68.9649°E	BNHS 3662	Present Study
10	*Myriopholis macrorhyncha*	Ghadechi, Bhavnagar, Gujarat[8]	21.7580°N; 72.1122°E	BNHS 3663	Present Study
11	*Myriopholis macrorhyncha*	Near Bhanvad, Devbhoomi Dwarka , Gujarat[9]	21.9499°N; 69.7641°E	RVT 01	Present Study
12	*Myriopholis macrorhyncha*	Near Rajula, Amreli, Gujarat[10]	21.0083°N; 71.4903°E	RVT 02	Present Study