

# Current Distribution of Earthworm *Lampito mauritii* with Special Reference to its Habitat Preference in Hyderabad-Karnataka Region, Karnataka, India

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**Abstract:** *Lampito mauritii* is a native Earthworm species of India. It is widely distributed in Hyderabad- Karnataka region of Karnataka, India. A field survey was conducted in selected habitats viz., gutter, bore well, garbage, garden, nursery, pasture, irrigated and non- irrigated lands in six districts of H-K region. *Lampito mauritii* was collected by digging and hand sorting method from 25 different sites. *Lampito mauritii* was most commonly found in the gutter and bore well followed by irrigated land, garbage and nursery. Availability of continuous moisture, optimum temperature, humidity and soil physicochemical characteristics has a great impact on the availability of *Lampito mauritii* in a particular habitat. This shows a remarkable species- habitat relationship.

**Keywords:** Distribution, Earthworm, Habitat, *Lampito*, Karnataka.

## I. INTRODUCTION

Earthworms are important biological resources that have tremendous potentials in agro-ecosystems because they significantly affect soil physical structure and organic matter dynamics and promote plant growth (Lee, 1985). They are beneficial in agro-ecosystem, therapeutic, nutritional & solid waste management. At present more than 6000 species have been described, among these around 3000-3500 are valid (Csuzdi, 2012).

Presently Indian earthworm fauna comprises about 505 species and subspecies belonging to 67 genera and 10 families have been identified from India (Kathireswari, 2016). Earthworm fauna of southern Karnataka has been studied by Bano and Kale (1991), Kale and Karmegam(2010), Siddaraju M., K.S. Sreepada and J.W. Reynolds (2010), Muddaiah Siddaraju, Kanale S. Sreepada and Krishna M P (2013). A very little diversity of northern Karnataka region is known from Kalaburagi city by Hatti (2013). However, the entire diversity and distribution pattern of Earthworm species in Hyderabad- Karnataka region is still not known completely.

*Lampito mauritii* (Kinberg, 1867) of the Megascolicidae family is one of the native species found in India. It can be easily identified by the following characters; Body length 100-140mm. Body diameter 2-2.5 mm. 157-210 body segments. Prostomiumprolobic. Setal arrangement lumbricine. The position of first dorsal pores 13/14. 2 pairs of bidiverticulate spermathecal pores present in 7/8/9. Clitellum annular ranges from 14-17. 1 pair of male pores present in 18. Seminal groove absent. 1 pair of racemose prostatic pores present in 18. Pineal setae present. Paired female pores present in 14. Monogiceriate. 3 pairs of extramural calciferous glands in 15,16&17. Prostate racemose. Last pair of hearts in 13. Intestine begins in 15. Typhlosole absent. *Lampito mauritii* was first identified and described by Kinberg in 1867. There recent reports of *Lampito mauritii* from Chennai (V.I. Ramzan Begum and Sultan Ahmed Ismail, 2003), Rajasthan (G. Tripathi and P. Bharadwaj, 2004), Tamil Nadu (Palanisamy Kathireswari, Jatinder M. Julka and John W. Reynolds, 2005), Pondicherry (A Sathianarayanan and Anisa B. Khan, 2006), Madhya Pradesh (Rahul Paliwal, 2008), Bangalore (Radha D Kale and Natchimuthu Karemngam, 2010), Madagascar (M. Rafindrakoto, Cs. Csuzdi, S. Rakotofiringa and E. Blanchart, 2010), Karnataka (Muddaiah Siddaraju, Kanale S. Sreepada and Krishna M P, 2013), Jharkhand (M.P.Sinha, RohitSrivastava and D.K. Gupta, 2013), Punjab (Mohan V.C. and Kaur A, 2013), Uttar Pradesh (Yogendra Kumar and Keshav Singh, 2013; Om Prakash, 2017), Haryana (Sharma R.K. and Bharadwaj Poonam, 2014), West Bengal (Rinku Goswami and C. K. Mondal, 2015), Kerala (M.P. Deepthi and P. Kathireswari, 2016)

## II. MATERIALS AND METHODS

Hyderabad-Karnataka region is located at 17° 35' and 18° 25' North latitudes and 75° 40' and 77° 11' East longitude in the north-eastern part of the Karnataka state. After merging with the Indian Union, the region was the part of the then Hyderabad State until 1956. The Hyderabad- Karnataka region comprises of Bidar, Kalaburagi, Yadgir, Raichur, Koppal and Bellary districts. This region is the second largest arid region after parts of Rajasthan in India. It has shown a high degree of underdevelopment compared to South Karnataka and therefore given special status under 371J. Very hot summers are the key causes for less fertile output in terms of agriculture in spite of two major rivers Krishna and Tungabhadra, flowing through the region

The collections of the Earthworms along with their habitat soils were made from the selected habitats of damp places like gutter, bore well, irrigated land, garden, pasture and garbage of districts of Hyderabad- Karnataka region from June 2017- January 2018. Earthworms were collected by digging and hand sorting method (Julka 1988) and physical parameters like temperature, humidity and location were recorded. Morphological observations of the collected earthworm were also noted down. Live earthworms along with their habitat soil were taken to the laboratory. The earthworms were then fixed and preserved (Julka and

Paliwal1993). Earthworms were identified using taxonomic key charts (Stephenson 1923; Gates 1972; Julka 1988) and also sent to ZSI for confirmation. Soil chemical parameters of the habitat soil such as  $p^H$ , OC (Organic Carbon), EC (Electrical Conductivity), P (Phosphorous) and K (Potassium) were analyzed.

### III. RESULTS

In the present study *Lampito mauritii* was found to be purely anecic species and was the most common and widely distributed species observed in Hyderabad- Karnataka region (Fig. 1). It was collected from 25 different sites from all the 6 districts of Hyderabad-Karnataka region. The details of the collection localities and habitat soils chemical parameters are listed in (Table 1). Abundance and availability chances of this species vary according to different habitats. Their number is highest in the gutter and near bore well followed by the garbage and irrigated land and least in nurseries. The presence of this species in particular habitats shows the specific habitat preference of this worm. It was found in the habitats, where there was a continuous supply of water. The occurrence of *Lampito mauritii* was high in gutter and bore well when compared to other pedoecosystems (Fig. 2). *Lampito mauritii* was found in the habitats with Temperature( $^{\circ}C$ ): 23-32; Humidity(%): 29-73;  $p^H$ :6.9-8.2; EC(mohs/cm): 0.15-2.5; OC(%):0.59-4.04; N(kg/acre):19.82-147.84; P(kg/acre):6.6-47.80 and K(kg/acre): 46-338.

District wise morphological colour variation was observed in *Lampito mauritii*. This species found in Bidar was having dorsal grey and ventral pale colour. This species found in Kalaburagi district have grey colour throughout its length. This species found in Yadgir district had light grey colour throughout the length with black tinge in anterior region. This species found in Raichur district had pale grey colour throughout its length. This species found in Koppal district was comparatively darker having dark grey colour throughout its length. This species found in Bellary district was having the darker anterior part. This clearly shows the nature of the habitat soil have great impact on the colour of the earthworms. In different habitats the size of *Lampito mauritii* varied. *Lampito mauritii* in the habitats where temperature is less were larger in size and in high temperature the size of the worm were comparatively smaller. It may be due to variation in the temperature.

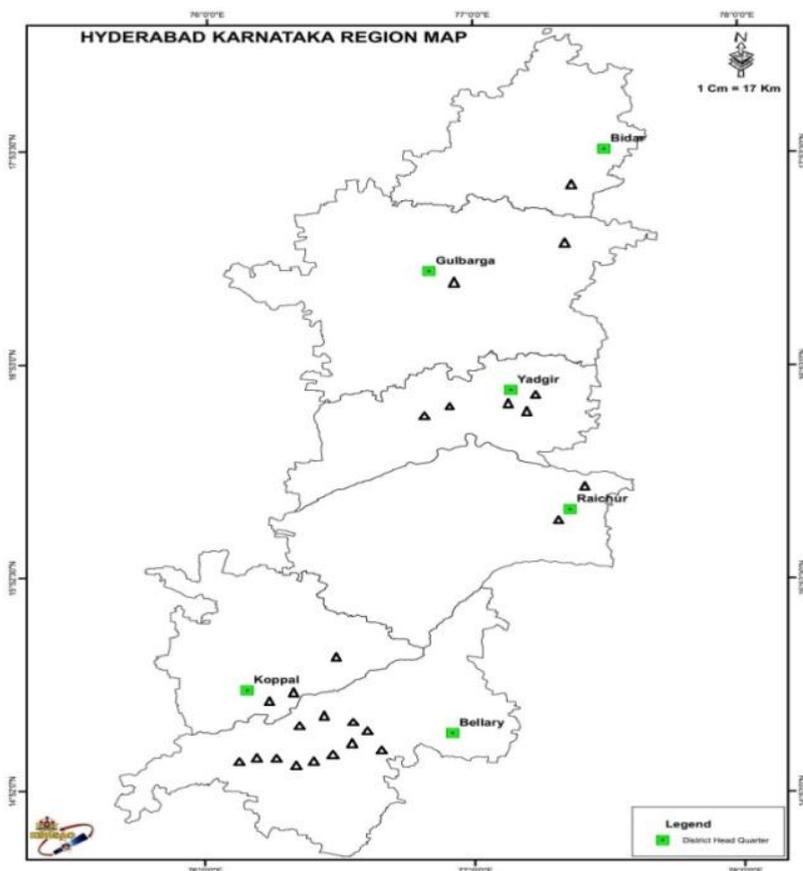


Figure 1: Map showing distribution of *Lampito mauritii* in Hyderabad-Karnataka region, India

Sl. No	DISTRICT	AREA	LOCATIO N	LOCAL ITY	TEMPR(°C)	HUMIDITY (%)	SOIL CHARACTERISTICS					
							p <sup>H</sup>	EC (moh s/cm)	OC (%)	N (Kg/a cre)	P (Kg/a cre)	K (Kg/ac re)
1	BIDAR	Homnabad	NL17 <sup>0</sup> 46'78" EL77 <sup>0</sup> 23'12"	Gutter	26	73	6.9	0.45	2.66	89.38	6.6	79
2	KALABURAGI	Hadebeernahalli	NL17 <sup>0</sup> 13'8" EL77 <sup>0</sup> 15'12"	Gutter	30	49	7.4	1.53	1.06	35.62	20.8	231
3		Kalaburagi	NL16 <sup>0</sup> 46'78" EL76 <sup>0</sup> 52'12"	Bore well	26	53	7.9	0.55	1.48	49.72	35.10	198
4	YADGIR	Rastapur	NL16 <sup>0</sup> 35'32" EL76 <sup>0</sup> 52'1"	Irrigated land	26	51	7.8	0.20	1.48	49.72	40.70	178
5		Kaudimatti	NL16 <sup>0</sup> 29'12" EL76 <sup>0</sup> 44'54"	Bore well	29	32	7.5	0.42	1.77	59.47	47.80	132
6		Arkerakhalsa	NL16 <sup>0</sup> 34'41" EL76 <sup>0</sup> 50'54"	Bore well	30	34	8.0	0.22	1.32	44.35	29.50	132
7		Mundregi	NL16 <sup>0</sup> 46'38" EL77 <sup>0</sup> 12'8"	Nursery	25	50	7.5	0.23	2.36	79.30	44.70	106
8		Panchsheelanagar	NL16 <sup>0</sup> 45'37" EL77 <sup>0</sup> 15'49"	Irrigated land	32	29	7.5	0.28	0.89	29.90	33.50	97
9	RAICHUR	Raichur	NL16 <sup>0</sup> 07'42" EL77 <sup>0</sup> 02'7"	Bore well	30	34	7.25	0.24	1.40	47.04	35.29	156.32
10		Malayabad	NL15 <sup>0</sup> 62'42" EL77 <sup>0</sup> 15'7"	Garbage	32	35	7.5	0.76	2.35	78.96	25.69	175.80
11	KOPPAL	Holemuddalapur a	NL15 <sup>0</sup> 17'0" EL76 <sup>0</sup> 20'1"	Garbage	24	79	7.4	1.01	2.52	84.67	15.7	226
12		Mattimudlapura	NL15 <sup>0</sup> 17'42" EL76 <sup>0</sup> 20'7"	Garbage	24	79	7.6	0.6	2.07	69.55	10.6	198
13		Rampur	NL15 <sup>0</sup> 22'4" EL76 <sup>0</sup> 30'7"	Bore well	35	35	7.7	0.28	0.81	27.22	32	307
14	BELLARY	Varadapura	NL15 <sup>0</sup> 8'28" EL76 <sup>0</sup> 17'37"	Gutter	23	87	7.4	0.95	4.04	147.8 4	21.8	150
15		Haregondanahalli	NL15 <sup>0</sup> 0'12" EL76 <sup>0</sup> 03'21"	Irrigated land	28	53	7.6	0.28	0.59	19.82	8.1	99
16		Ittigi	NL14 <sup>0</sup> 57'12" EL76 <sup>0</sup> 5'23"	Gutter	26	68	8.2	0.15	0.87	29.23	30.03	141
17		Ittigi	NL15 <sup>0</sup> 02'12" EL76 <sup>0</sup> 10'23"	Bore well	27	54	8	0.4	2.41	80.97	14.7	338
18		Shivapur	NL14 <sup>0</sup> 57'28" EL76 <sup>0</sup> 21'50"	Gutter	28	54	7.7	0.46	2.41	80.97	19.3	196
19		Chikkakerehalli	NL14 <sup>0</sup> 57'47" EL76 <sup>0</sup> 26'3"	Garbage	30	50	7.8	0.39	1.03	34.61	24.9	166
20		Emmignur	NL15 <sup>0</sup> 23'40" EL76 <sup>0</sup> 42'38"	Gutter	30	49	7.2	2.5	2.52	84.67	11.7	265
21		Orvai	NL15 <sup>0</sup> 22'10" EL76 <sup>0</sup> 34'45"	Irrigated land	29	48	7.7	0.2	0.67	22.51	23.4	107
22		Somlapur cross	NL15 <sup>0</sup> 14'5" EL76 <sup>0</sup> 28'15"	Bore well	32	40	7.2	0.32	2.69	90.38	11.7	300
23		Hanumanahalli	NL15 <sup>0</sup> 10'54" EL76 <sup>0</sup> 22'38"	Gutter	30	50	8.00	0.38	2.07	69.55	39.70	177
24		Danapuram	NL15 <sup>0</sup> 9'38" EL76 <sup>0</sup> 21'49"	Bore well	29	46	7.2	0.18	1.48	49.72	21.8	76
25	Mariyammanahalli	NL15 <sup>0</sup> 9'27" EL76 <sup>0</sup> 21'33"	Gutter	25	74	7.4	1.5	2.02	67.87	27.9	249	

Table 1: Details of the distribution and Soil Chemical Parameters of the Habitat soils

Note: EC-Electrical Conductivity, OC-Organic Carbon, N-Nitrogen, P- Potassium, K- Potassium.

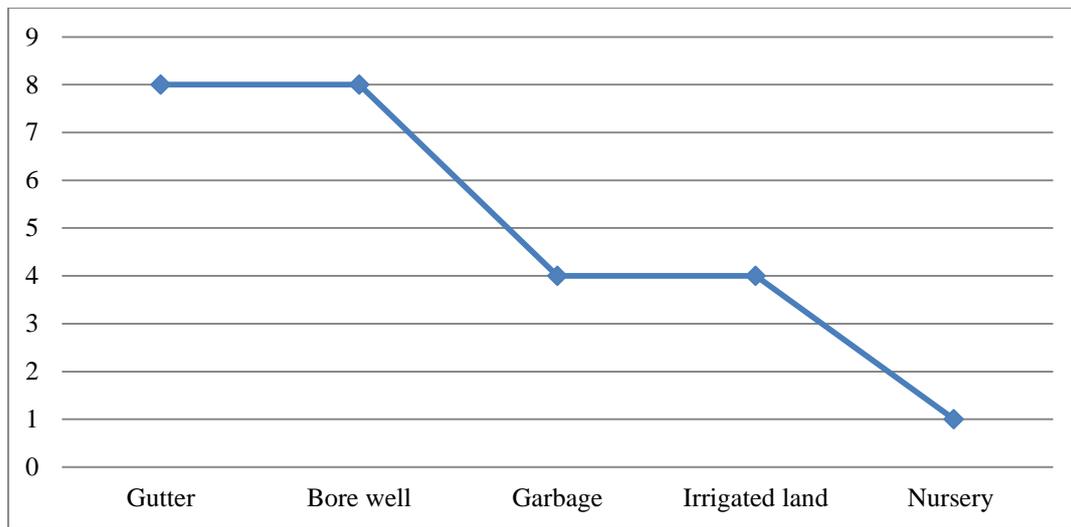


Figure: 2 Distribution of *Lampito mauritii* in different habitats

#### IV. DISCUSSION

The distribution of *Lampito mauritii* was mainly dependent on the physicochemical characteristics of the soil. The present study is more or less in agreement with the findings of other workers (Lavelle, 1964; Edwards & Lofty, 1977; Appelhof, 1981; Lee, 1985). Various parameters play a vital role in regulating the distribution of earthworms (Ismail et al., 1990). Many workers have also studied the habitat preference of various earthworm species (Singh, 1997; Scullion and Mallik, 2000; G. Tripathi and P. Bhardwaj, 2004).

#### V. CONCLUSION

To conclude *Lampito mauritii* is distributed all over Hyderabad- Karnataka region. Further work is to be carried out to explore its vermicomposting and other application aspects.

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