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SHORT COMMUNICATION

NEW RECORDS OF EARTHWORM FAUNA (OLIGOCHAETA: GLOSSOSCOLECIDAE AND MEGASCOLECIDAE) COLLECTED FROM SATKOSIA-BAISPALLI WILDLIFE SANCTUARY OF ODISHA, INDIA

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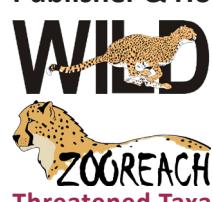
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NEW RECORDS OF EARTHWORM FAUNA (OLIGOCHAETA: GLOSSOSCOLECIDAE AND MEGASCOLECIDAE) COLLECTED FROM SATKOSIA-BAISIPALLI WILDLIFE SANCTUARY OF ODISHA, INDIA

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Abstract: A survey work was conducted in Satkoshia-Baisapalli Wildlife Sanctuary in Odisha, India, where altogether 10 earthworm species were collected. Out of these, four species—*Pontoscolex corethrurus* (Müller, 1856), *Metaphire houletti* (Perrier, 1872), *Perionyx bainii* Stephenson, 1915, *Perionyx barotensis* Julka & Paliwal 1993—are reported for the first time after the original description and is proved to be a new record for the state of Odisha.

Keywords: Earthworms, *Metaphire houletti*, new record, Odisha, *Perionyx bainii*, *Perionyx barotensis*, *Pontoscolex corethrurus*, taxonomic.

Extensive areas in Indian forest reserves are still unexplored and have never been sampled for earthworms. To estimate earthworm biodiversity correctly, the majority of species in the country are yet to be found and described. Consequently, new locations should be sampled, which represents a great challenge, since there are few researchers working in this area. With this view Satkoshia-Baisapalli Wildlife Sanctuaries in Odisha, India were selected for earthworm faunal survey (Image 1). These twin reserves are the meeting point of two bio-geographic regions of India, the Deccan peninsula and the Eastern Ghats, contributing immense

earthworm diversity in that area. The landscape is hilly and the general elevation is around 350m from sea level. The climate of the region is tropical resulting in high summer temperatures. The Satkoshia gorge of the river Mahanadi and the reserve has tremendous genetic and ecological importance.

The first record of earthworms from Odisha was published by Michaelsen (1910). The work was followed by Stephenson and he described several species (1914, 1915, 1916, 1917, 1921, 1923, 1926). Subsequently, many other scientists presented data about earthworms from Odisha, viz., Julka (1976, 1978), Patra & Dash (1973), Das & Patra (1977), Senapati & Dash (1979, 1981, 1982, 1983), Dash & Senapati (1980), Senapati et al. (1979), Senapati (1980). Thirty species are described by Julka et al. (1987). Blakemore (2006) made a checklist of earthworms of Odisha and Goswami et al. (2013) worked on taxonomical records of earthworms from Odisha. The aim of the present paper is to report on these collections, including four new records from Odisha (Fig. 1).

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Competing interests: The author declares no competing interests.

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MATERIALS AND METHODS

Live earthworm were narcotised in 70% alcohol and then washed and preserved in 10% formalin with proper labeling. The specimens were studied under the Leica EZ4 microscopic binocular. All the studied specimens are deposited at the National Zoological Collection of Zoological Survey of India, Kolkata. The registration numbers are mentioned in material examined. GPS with elevation, temperature and pH were recorded during the collection. Photographs were taken by Leica EZ4HD to specify the identified characters.

Taxonomic description

I. Family: Glossoscolecidae

1. Genus *Pontoscolex* Schmarda, 1861
 - (1) *Pontoscolex corethrurus* (Muller, 1856)
- ### II. Family: Megascolecidae
2. Genus *Metaphire* Sims & Easton, 1972
 - (2) *Metaphire houletti* (Perrier, 1872)
 3. Genus *Perionyx* Perrier, 1872
 - (3) *Perionyx bainii* Stephenson, 1915
 - (4) *Perionyx barotensis* Julka & Paliwal, 1993

Systematic Accounts

I. Family Glossoscolecidae

1. Genus *Pontoscolex* Schmarda 1861
- (1) *Pontoscolex corethrurus* (Muller) (Image 2)
1856. *Lumbricus corethrurus* Muller, Abhandl.

Naturgesch. Ges. Halle, 4:26.

1897. *Pontoscolex corethrurus*: Michaelsen, Mitt. Mus. Hamburg, 14: 247

Diagnosis: Length 45–100 mm.; diameter 2-4 mm. Segments 60-230. Dorsal side is reddish brown and ventral side is colourless. Dorsal pore absent. Prostomium elongated like a long thin proboscis while it moves. Clitellum saddle shaped, covering 14–22. Setae lumbricine, i.e., 8 per segment in regular rows, but in the tail region setae rows enlarged and becomes alternative in adjacent segments i.e., quincunx arrangement. Male pores (20/21) and 3 pairs spermathecal pores (6/7-8/9) are minute. Female pore is a transverse slit at left side of mid ventral line at AB, in front of intersegmental furrow 14/15.

Distribution: India (Odisha, Andaman Islands, Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Tamil



Image 1. Study area - different locations in Satkoshia-Baisipalli Wildlife Sanctuary in Odisha

Nadu, West Bengal), Africa, Australia, Belize, Indonesia, Iran, Madagascar, Mexico, Myanmar, Pakistan, Sri Lanka, South America, Thailand, USA.

Type locality: Itajahy, Brazil.

Material examined: An4112/1 ZSI, 17exs., 26.i. 2016, Tarva, Pampasar range of Satkoshia, 20.70081°N & 84.83843°E, coll. R. Goswami.

Remarks: This species make the soil hard and compact.

II. Family Megascolecidae

2. Genus *Metaphire* Sims & Easton, 1972

(2) *Metaphire houletti* (Perrier, 1872) (Image 3)

1872. *Perichaeta houletti*, Perrier, Nouv. archs. Mus. Hist. nat. Paris, 8: 99.

1900. *Pheretima houletti* (in part), Michaelsen, Tierreich, 10: 273.

1982. *Metaphire houletti*, Julka, Rec. Zool. Surv. India, 80: 142.

Diagnosis: Length 60–105 mm, diameter 2–3 mm, segments 95–100. Colour brownish on dorsal side. Prostomium epilobic, tongue open. Combined & paired male and prostatic pores. Female pore single on xiv. Spermathecal pores paired in 6/7/8/9. External genital markings absent.

Distribution: India (Odisha, Andaman & Nicobar Islands, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, West Bengal), Australia, Bahamas, Bangladesh, Caroline Islands, China, Cuba, Fiji, France, French Guiana, Indonesia, Madagascar, Malay Peninsula, Myanmar, Nepal, Pakistan, Philippines, Salvador, Sierra Leone, Singapore, Sri Lanka, Thailand, USA (Florida), Vietnam.

Type locality: Kolkata, West Bengal, India.

Material examined: An4105/1 ZSI, 7exs., 26.i.2016, Hatibari mundasai -1 of Satkoshia, 20.6197°N & 84.80745°E, coll. R. Goswami. An4114/1 ZSI, 19exs., 27.i.2016, Chotakei, Purnakote range of Satkoshia, 20.63511°N & 84.88006°E, coll. R. Goswami.

Remarks: The origin of this species is in Southeast Asia.

3. Genus *Perionyx* Perrier 1872

(3) *Perionyx bainii* Stephenson, 1915 (Image 4)

1915. *Perionyx bainii* Stephenson, Mem. Indian Mus., 6: 72

Diagnosis: Length 50–65 mm, diameter 3–3.5 mm, segments 84–100. Colour bluish purple, pale ventrally. Prostomium epilobic, tongue open. Clitellum annular, xiii–xvii. Paired male and prostatic pores are combined in the xviii segment. 7–10 penial setae present to each pore in the median. Spermathecal pores in 7/8/9 in large transverse slits.

Distribution: India (Odisha, Himachal Pradesh, Uttar Pradesh).

Material examined: AnSZ 161 ZSI 3 exs., 20.i.16, Kuanria dam-2 of Baisipalli, 20.34698°N & 84.80726°E, coll. R. Goswami.

(4) *Perionyx barotensis* Julka & Paliwal 1993 (Image 5)

1993. *Perionyx barotensis* Julka & Paliwal, J. Bom. Nat. His. Soc. 90(3): 461–462.

Diagnosis: Length 70–90 mm, diameter 2–3 mm, segments 103–125. Colour bluish purple, pale ventrally. Prostomium epilobic. Tongue open. Clitellum annular, xiii–xvii. Transversely elliptical male genital area on xviii.

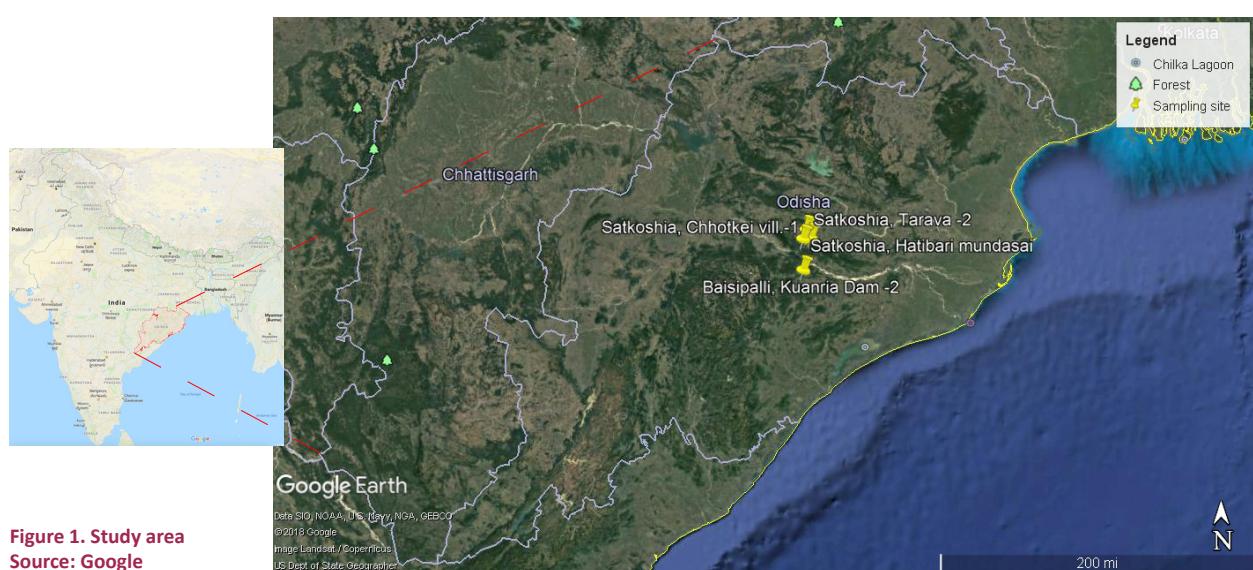




Image 2. Prostomium and genital organs of *Pontoscolex corethrurus*



Image 3. Prostomium and genital organs of *Metaphire houletti*



Image 4. Prostomium and genital organs of *Perionyx bainii*



Image 5. Prostomium and genital organs of *Perionyx barotensis*

Male pores and minute prostatic pores are combined. Paired, minute spermathecal pores on 7/8/9.

Distribution: India: Odisha, Himachal Pradesh, Uttar Pradesh.

Material examined: AnSZ173 ZSI, 1 ex., 20.i.16, Kuanria dam of Baisipalli, 20.34698°N & 84.80726°E coll. R. Goswami; An4105/19 ZSI, exs., 26.i.16, Hatibari mundasai -1of Satkoshia, 20.61966°N & 84.80733°E, coll. R. Goswami.

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Table 1. The location, different edaphic factors, and new record species of earthworms in different collecting spots.

Camp name & WS Range	Date	Collection Area	GPS	No. of Earthworm exs	pH	Temp at °C	Elevation (Feet)	Name of the species
Satkoshia (Pampasar Range)	26.i.16	Tarava -2	20.70081°N & 84.83843°E	17	7.17	22.3	13	<i>Pontoscolex corethrurus</i> (Muller, 1856)
Satkoshia (Tikarpada Range)	26.i.16	Hatibari mundasai -1	20.61970°N & 84.80745°E	7	7.16	21.2	45	<i>Metaphire houletti</i> (Perrier, 1872)
	26.1.16	Hatibari mundasai-2	20.61966°N & 84.80733°E	1	7.15	21.5	45	<i>Metaphire houletti</i> (Perrier, 1872)
Satkoshia (Pampasar Range)	26.1.16	Tarava -1	20.70068°N & 84.8386°E	1	7.19	22.4	13	<i>Metaphire houletti</i> (Perrier, 1872)
Satkoshia, Purunakote Range (Chhotkei)	27.1.16	Chhotkei vill.-1	20.63511°N & 84.88006°E	19	7.37	23.5	25	<i>Metaphire houletti</i> (Perrier, 1872)
Baisipalli- Kuanria (Banigocha west Range)	20.1.16	Kuanria Dam -2	20.34698°N & 84.80726°E	3	7.5	23.3	11	<i>Perionyx bainii</i> Stephenson, 1915
Baisipalli- Kuanria (Banigocha west Range)	20.1.16	Kuanria Dam -2	20.34698°N & 84.80726°E	1	7.5	23.3	11	<i>Perionyx barotensis</i> Julka & Paliwal, 1993
Satkoshia (Tikarpada Range)	26.1.16	Hatibari mundasai -1	20.61966°N & 84.80733°E	9	7.15	21.5	45	<i>Perionyx barotensis</i> Julka & Paliwal, 1993

Key to the identification of earthworms of the new records

1. Setae 8 on each segment in 4 pairs throughout the body 2
- 1'. Setae numerous or, more than 8 on each segment throughout the body 3
2. Setae on posterior segments arranged in irregular rows, alternating between dorsal and ventral positions ... *Pontoscolex corethrurus*
3. Nephridia astomate, gizzard between 7/8 and 9/10, male pores within copulatory pouches 4
- 3'. Nephridia stomate, colour usually reddish to violet; gizzard vestigial in segment v or vi 5
4. Invaginated spermathecal pores recognizable internally by the presence of stalked glands. Genital markings, when present, small and in the vicinity of spermathecal pores *Metaphire houletti*
5. Male pores are longitudinal slits, each overhung by a small tubercle. A group of penial setae present to each male pore *Perionyx bainii*
- 5'. Male pores and minute prostatic pores are combined. Male genital field without penial setae *Perionyx barotensis*

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