

EARTHWORMS OF SOUTH 24 PARGANAS WITH ECOLOGICAL NOTES

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INTRODUCTION

Earthworms occur in diversified habitats from organic heaps (manure, compost, litter, humus, kitchen drainage, etc.) to forest land, grassland, agricultural land, plant nursery, etc. They are omnivorous, but most of them derive nutrition from dead organic matter. The beneficial effect of earthworms in increasing soil fertility has been documented since the time of Darwin (1881). Presently, earthworms are not restricted as a basic biology material but is being established as basic material for biotechnology (vermitechnology). Because of the vast number of species available in India and also because of the economic value, understanding of the distribution, abundance and ecological condition of the species has become very important.

There are more than 4400 species of earthworms in the world, where as in India 560 (Julka *et al.*, 2009). From the literature (Halder, 1998) it reveals that there are seven species of earthworms in South 24 Parganas namely *Pontodrilus bermudensis* Beddard, 1891, *Metaphire houlleti* (Perrier, 1872) *Lampito mauritii* Kinberg, 1867 *Metaphire posthuma* (Vaillant, 1868), *Perionyx excavatus* Perrier, 1872, *Polypheretima elongata* (Perrier, 1872), *Eutyphoeus orientalis* (Beddard, 1833), *Octochaetona beatrix* (Beddard, 1902).

Authors collected seven species of earthworms from south 24 parganas during 2012-2013 survey. Out of seven species of earthworms, three species **Glyphidrilus tuberosus* Stephenson, 1916, **Dichogaster bulau* (Michaelsen, 1891), and **Amyntas diffringens* (Baird, 1869) are new in the district.

Species marked with asterix (*) are recorded for the first time from the District.

LIST OF THE EARTHWORMS RECORDED SO FAR IN SOUTH 24 PARGANAS

Family ACANTHODRILIDAE

1. *Pontodrilus bermudensis* Beddard, 1891

Family MEGASCOLECIDAE

2. **Amyntas diffringens* (Baird, 1869).
3. *Lampito mauritii* Kinberg, 1867
4. *Metaphire houlleti* (Perrier, 1872)
5. *Metaphire posthuma* (Vaillant, 1868),
6. *Perionyx excavatus* Perrier, 1872,
7. *Polypheretima elongata* (Perrier, 1872),

Family OCTOCHAETIDAE

8. *Eutyphoeus orientalis* (Beddard, 1833),
9. *Octochaetona beatrix* (Beddard, 1902).
10. **Dichogaster bulau* (Michaelsen, 1891),

Family ALMIDAE

11. **Glyphidrilus tuberosus* Stephenson, 1916,

SYSTEMATIC ACCOUNTS

Family ACANTHODRILIDAE

Genus *Pontodrilus* Beddard, 1874

1. *Pontodrilus bermudensis* Beddard, 1891
1891 *Pontodrilus burmudensis* Beddard, *Ann. Mag. nat. Hist.*, (ser.6), 7: 96.

Diagnosis: Length within 32-120 mm. Segments 78-125. Prostomium epilobic, tongue open. Clitellum saddle-shaped within segment XIII-XVII. Genital markings unpaired, median in 19/20, occasionally in 12/13, 13/14 segment.

Distribution: India: Andaman & Nicobar Island;

Andhra Pradesh; Goa; Kerala; Lakshadweep Islands; Maharashtra; Orissa; Tamil Nadu; West Bengal.

Outside India: Africa, Madagascar, Sri Lanka, Maldives, Myanmar, Vietnam, Indonesia; Australia, Some Islands in the Pacific Ocean; USA; West Indies, South America.

Remarks: This is a peregrine species inhabiting in mud with organic matter and salt on sea shore and margins of estuaries and brackish water lakes.

Family MEGASCOLECIDAE

Genus *Lampito* Kinberg, 1867

2. *Lampito mauritii* Kinberg, 1867

Material: 18 exs., Canal side, Bamanghata, South 24 Parganas; 11.07.2012, Dr. C.K.Mandal; Registration No. An 3939/1.

Diagnosis: Length 90 –115 mm, diameter 3-5 mm, segments 150 –178. Clitellum annular, dorsal pores present. Digestive system with a single esophageal gizzard in V segment. Male pores paired on XVIII. Female pores paired on XIV.

Distribution: India: All over India and world.

Ecological Notes: Greyish-yellow in living condition; living in top 10 cm of semi-moist sandy-loam soil, sometimes blackish soil; castings abundantly available in lawns and grass beds on the border line of grassy area and open area, deposited on the surface of the soil in the form of small heaps of spherical or nearly globular pellets.

Remarks: These worms are reported to the utilised as waste conditioners. But survival rate of this species is very poor in artificial culture beds.

Genus *Metaphire* Sims and Easton, 1972

3. *Metaphire houlleti* (Perrier, 1872)

Diagnosis: Length 40-130 mm, diameter 3-5 mm. Segments 90-120. Genital markings none externally. Prostates in XVI-XXIII segment. Castings are scattered or low piles.

Distribution: India: Uttarakhand; West Bengal; Meghalaya; Andaman and Nicobar Islands, Uttar Pradesh.

Outside India: Central America; West Indies.

4. *Metaphire posthuma* Vaillant, 1868

Material examined: 2 exs., Paddy field Budge budge, South 24 Parganas; 11.07.2012. Rinku Goswami.

Diagnosis: Length 60-140 mm, diameter 3-8 mm. Segments 91-124. Prostomium epilobic. Genital markings paired. Female pore single, mid-ventral on XIV segment. Male pores, minute and invaginate, on XVIII segment.

Distribution: India: Almost all over India.

Outside India: Pakistan; Bangladesh; Myanmar; Thailand; Vietnam; Malay Peninsula; Indonesia; Philippines; U.S.A.

Genus *Perionyx* Perrier, 1872

5. *Perionyx excavatus* Perrier, 1872

Material examined: 2 exs., Canal side, Bamanghata, South 24 Parganas; 11.07.2012, Dr. C.K. Mandal.

Diagnosis: Length 30 –180 mm, diameter 3-7 mm, segments 123-178. Colour deep purple. Prostomium epilobic, tongue open. Clitellum on XIII- XVII segment. Female pore on segment XIV. Gizzard absent or rudimentary. Prostrate in XVIII segment.

Ecological Notes: Colour deep purple to reddish brown dorsally, pale ventrally; castings deposited on the soil surface in the form of short threads or rods, deposited also beneath the surface in compost heaps; abundantly available in manure & compost heaps – under logs, bricks, rocks, near water line with rich organic deposits, canals, swamps, debris in axel of plantain leaves, just below the surface, even under rotten leaves and in forks of trees; lives in aquatic plants, soil near water courses, saturated with water from bathrooms, cookhouse, dhobi compound, black earth and paddy fields.

Distribution: India: Almost all over India.

Outside India: Madagascar and its adjacent islands; Sri Lanka; Myanmar; Thailand; Malay Peninsula; Indonesia; Philippines; Taiwan; West Indies.

Remarks: This species is largely used as waste conditioner. These worms are also cultured for utilisation as animal protein in poultry and fish feed.

Genus *Polypheretima* Michaelsen, 1934

6. *Polypheretima elongata* (Perrier, 1872)

Diagnosis: Length 40-360 mm, diameter 1.5-10 mm, segments 136-297. Prostomium rudimentary. Genital markings transversely elliptical, paired, presetal on XIX and successive segments in line with or slightly median to male pores. Female pore single, mid-ventral, on XIV. Male pores on segment XVIII.

Distribution: India: West Bengal; Andaman and Nicobar Islands; Andhra Pradesh; Karnataka; Madhya Pradesh; Maharashtra; Tamil Nadu

Outside India: Africa; Madagascar; Comoro Island; Pakistan; Sri Lanka; Myanmar; Bangladesh; Thailand; Malay Peninsula; Indonesia; Philippines; Taiwan; Australia; Papua New Guinea; New Britain; New Caledonia; Caroline Islands; Ryuku Islands; Hawaii; Tahiti; West Indies; South America.

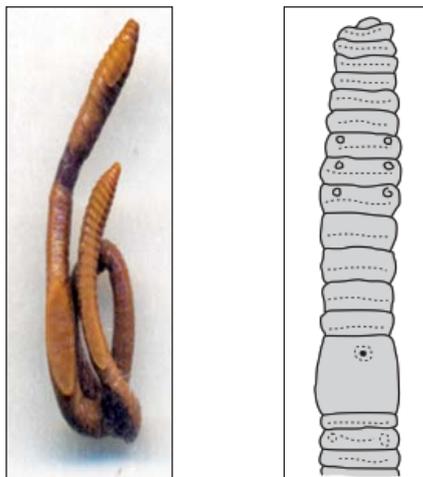
Ecological Notes: Under compost and manure heaps, rubbish, soils-red, black cotton or black taro; castings are found on soil surface in the form of cords of about 2 mm thickness and 20-24 mm in length or in irregular piles of 10-20 mm high and 20-35 mm wide.

Economic Importance: In Karnataka, this species was found to have the soil compact.

Remarks: The species was originated from the region including Indonesia and Philippines.

Genus *Amyntas* Kinberg, 1867

7. *Amyntas diffringens* (Baird, 1869)



Amyntas diffringens *Amyntas diffringens*(Ventral)

Cited from Fauna of India (J.M. Julka, 1988)

Material examined: 2 exs., Reg. No. An 3954/1, near canal, Budge Budge, South 24 Parganas, 11.07.2012, Rinku Goswami.

Diagnosis: Length 45-170 mm. Diameter 3-6 mm. Segment 79-121. Prostomium epibolic, tongue open. Clitellum on XIV-XVI segment. Genital markings small.

Distribution: India: Uttarakhand; West Bengal; Himachal Pradesh; Jammu and Kashmir; Sikkim; Tamil Nadu; Uttar Pradesh; Arunachal Pradesh; Assam; Karnataka; Manipur; Meghalaya.

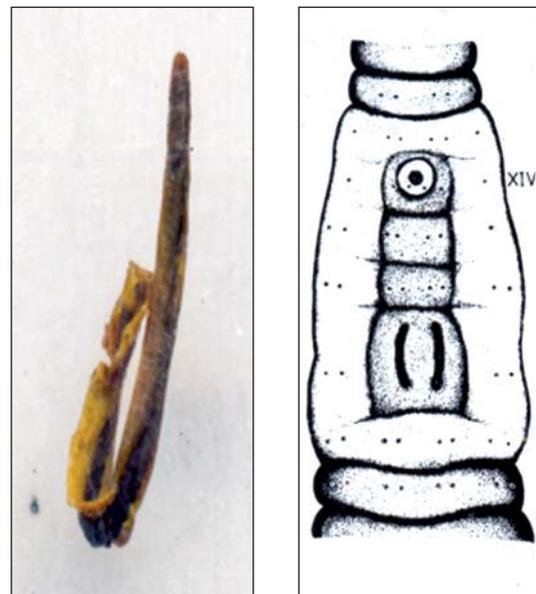
Outside India: Africa; Madagascar; Europe; China; Korea; Japan; Sri Lanka; Nepal; Bhutan; Bangladesh; Myanmar; Indonesia; Philippines; Hainan; Hong Kong; Taiwan; Australia; New Zealand; Some islands in the Pacific Ocean; U.S.A; Central America; West Indies; South America.

Remarks: The species have been recorded first time from South 24 Parganas District.

Family OCTOCHAETIDAE

Genus *Dichogaster* Beddard, 1888.

8. *Dichogaster bolau* (Michaelsen, 1900)



Dichogaster bolau

Cited from Fauna of India
(J.M. Julka, 1988)
(Genital markings are shown)

Material examined: 2 exs., An 3931, Rose garden, Budge Budge, South 24 Parganas. 11.07.2012, Rinku Goswami.

Diagnosis: Length 19-23 mm, diameter 1-3mm. Segments 70-98. Prostomium epilobous. Tongue closed. Clitellum on XIII-XXI. Male pores minute on XVIII segment.

Female pores single, median, and presetal. Genital markings absent.

Distribution: India: Uttarakhand; West Bengal; Andaman and Nicobar Islands; Andhra Pradesh; Himachal Pradesh; Jammu and Kashmir; Sikkim; Tamil Nadu; Uttar Pradesh; Arunachal Pradesh; Karnataka; Kerala; Assam; Karnataka; Manipur; Meghalaya; Goa; Gujarat; Maharashtra; Orissa; Sikkim; Rajasthan.

Outside India: Africa; Madagascar; Europe; China; Korea; Japan; Sri Lanka; Nepal; Bhutan; Bangla Desh; Myanmar; Indonesia; Philippines; Hainan; Hong Kong; Taiwan; Australia; New Zealand; Some islands in the Pacific Ocean; U.S.A; Central America; West Indies; North America; South America; Vietnam; Some Islands of Pacific ocean.

Genus *Eutyphoeus* Michaelsen 1900

9. *Eutyphoeus orientalis* (Beddard, 1833)

Material: 2 exs., Garden, Bamanghata, South 24 Parganas, West Bengal. 27.09.2011, Coll. Dr. C.K.Mandal and Rinku Goswami; Registration No. An 3957/1.

Diagnosis: Length 130-250 mm, diameter 5-10 mm. Segments 164-220. Clitellum on XIV-XVI segment. Female pore single on left side. Spermathecal pores paired. Penis short and annular.

Female pores paired. Genital markings absent.

Distribution: India: West Bengal; Bihar; Uttar Pradesh.

Outside India: Bangladesh.

Ecological Notes: Dark grey in living condition; top 15-35 cm of soil; grass bed on soil heaps.

Genus *Octochaetona* Gates, 1862

10. *Octochaetona beatrix* (Beddard, 1902)

Diagnosis Measurements: length 70-150 mm, diameter 3-7 mm, segments 131-176.

Prostomium proepilobous. Tongue closed. Clitellum on XIII-XVIII. Male pores minute.

Female pores paired. Genital markings absent.

Distribution: India: Uttarakhand; Uttar Pradesh; Madhya Pradesh; Arunachal Pradesh; Maharashtra; Gujarat; West Bengal; Karnataka.

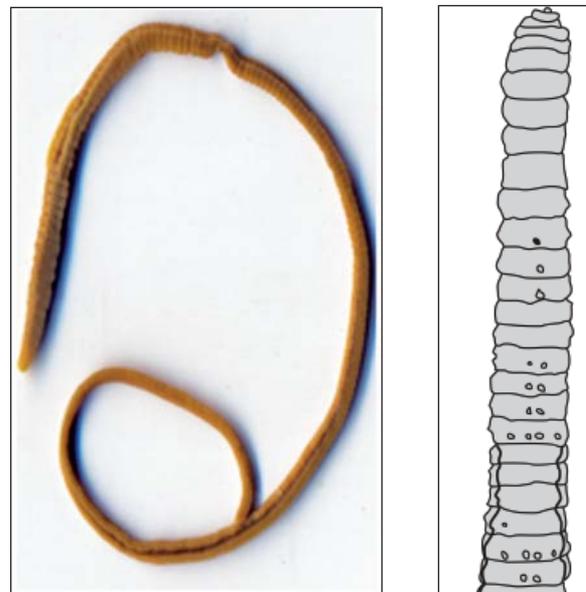
Outside India: Pakistan; Myanmar; Malay Peninsula; Philippines

Ecological Notes: In living condition pale grey, clitellum orange; top 5-10 cm of soil littered with twigs, flowers and fruity parts of trees; very moist clay loam below Madder trees; pellet like castings.

Family ALMIDAE

Genus *Glyphidrilus* Horst, 1889

11. **Glyphidrilus tuberosus* Stephenson, 1916,



Glyphidrilus tuberosus Cited from Fauna of India (J.M. Julka, 1988)

(Genital markings are shown)

Material examined: 3 exs., Paddy field, Bhangar, West Bengal, 15.08.2012; Coll. Dr. C.K. Mandal.

Diagnosis: Length 60-118 mm, diameter 2.5-3 mm, Segments 221. Clitellum annular, wings XX-XXIV. Genital markings small, circular to elliptical tubercles. Female pores paired on XIV.

Remarks: First recorded from South 24 Parganas District.

Distribution: India: Uttarakhand; Uttar Pradesh; Madhya Pradesh.

Outside India: Myanmar.

Background Information: Most of the earthworms feed decaying organic matter in the soil and after its assimilation in the alimentary canal, excrete the soil as cast (veremicast) which is rich in nutrients. This vermicast contains various amino acids, minerals and microorganism's which humify the organic matter in the surrounding soil and act as soil conditioners and bio fertilisers. However, the capability of decomposing organic matter varies from species to species. It is very essential to select suitable species of earthworms for the purpose of waste conversion by vermicomposting. Therefore,

a detail information is needed about the availability of earthworm species their habit, conditions of living, and nature in a particular area.

Importance of the Work: The present study includes an elaborate information on the habitat condition, colour in living condition, natural size, type of castings, abundance and seasonal occurrence of the earthworm fauna in South 24 Parganas. Moreover, the well-known worm (*Lampito mauritii*) has been recorded abundantly in a particular locality. This locality may serve as a natural store house for the species.

Results: Three species **Glyphidrilus tuberosus* Stephenson, 1916, *Dichogaster bulau* (Michaelsen, 1891), and *Amyntas diffringens* (Baird, 1869) which are new in this district. Now the total number of species of earthworms of South 24 Parganas is 11.

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