



## REPORT ON THE SOIL FAUNA OF BHADRAK AND BALASORE DISTRICT, ORISSA

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### INTRODUCTION

Soil is one of the basic natural resources that supports life on Earth. It is a huge ecosystem, which is the habitat to several living organisms. Historically, most of the efforts on biodiversity studies focused, especially on aboveground plant and animal species (Wardle, 2006). However, it is well recognized that in most terrestrial ecosystems, the belowground biota supports much greater diversity of organisms than does the aboveground biota, because soils are the central organising entities in terrestrial ecosystems (Coleman, and Whitman, 2005). Soil fauna is a highly diverse group of organisms living within the soil and make soil alive by their activity. They represent most classes and orders and are extremely abundant and species rich (Anderson, 1977). They are determining factor in soil formation and influence all the properties of soil, including fertility and quality. They play important role in supporting plant communities on the earth surface. One of the major activity of soil fauna is decomposition and cycling of organic matter in soil. Soil fauna communities, including soil inhabiting invertebrates, are known to improve soil structure by decreasing bulk density, increasing soil pore space, soil horizon mixing, increased aeration and drainage, increased water holding capacity, litter decomposition and improving soil aggregate structure (Abbott, 1989). They act as bioindicators of soil health. Identifying, counting of soil fauna and associated abiotic factors can help to assess the functioning of the soil ecosystem indicating soil fauna diversity.

In this study, the assessment of soil fauna in the study areas aimed at obtaining a general overview of soil fauna in the ecosystems of the region. Perusal of published literature shows no such systematic study was conducted in these areas of our study zone previously.

### Soil Fauna and their Function in Soil

There are many animal groups inhabiting soil system. It has been reported that of the total number of described species on Earth (~1,500,000), as many as 23 per cent are soil animals (Decaens *et al.*, 2006). Estimated numbers of soil species include 30,000 bacteria; 1,500,000 fungi; 60,000 algae; 10,000 protozoa; 500,000 nematodes; and 3,000 earthworms (Pankhurst, 1997). The interdependence of soil biological fertility with physical and chemical characteristics of soil is established. Among invertebrate soil animals, nematodes, annelids (mainly earthworms) and arthropods represent the most numerous and diversified groups. Among all the groups of soil fauna, arthropods constitute the greatest number and diversity of soil inhabiting species. Most soil animals occur in the top 30 cm of soil, although some also occur at depth. In most environments, the most abundant soil dwellers are collembolan (springtails) and mites, (Andre *et al.* 1994, Coleman, and Crossley 1996) though ants and termites predominate in certain situations, especially in desert and tropical soils. Significant effects of soil fauna on soil structure are achieved mainly by three most important groups which are earthworms, termites and ants (Lee and Foster, 1991).

Soil organisms perform vital functions in the soil to a varying degree depending on the system.

Soil organisms make up the diversity of life in the soil. They play an important role in the decomposition and cycling of organic matter (OM) in soil systems. Insects, earthworms, and other arthropods churn the soil and promote formation of soil structure. Earthworm burrowing in the soil creates channels for aeration, root penetration, reduction in bulk density, enhancement of water infiltration and nutrient cycling. Some soil fauna ingest organic matter by taking in soil, applying digestive enzymes, and excreting the soil/OM complex, thus providing a more readily available food source for other soil fauna and soil micro-organisms. Earthworms, termites, millipedes, centipedes and woodlice ingest soil particles with their food and contribute to aggregate formation by mixing organic and mineral matter in their gut. Some soil fauna contribute to the carbon cycle by fixation (photosynthesis). One group of soil fauna is particularly important in nitrogen cycling.

### Topographical description of the Study Areas

The present study was conducted in the two districts namely, Bhadrak and Balasore of the state of Orissa in West Bengal, India. The topographical description of the study areas gives an idea of different ecosystems that prevail in these areas.

**1. Bhadrak** – Bhadrak is one of the important coastal districts of Orissa. The area is in the east of Bay of Bengal and is located between longitude  $86^{\circ} 30' 0''$  E and latitude  $21^{\circ} 4' 0''$  N. The area of this district is  $1721 \text{ Km}^2$ . There are 5 types of forests in the Bhadrak district. The total forest area is  $97 \text{ Km}^2$ .

It is a level tract of alluvial soil with a gradual slope eastwards to the Bay of Bengal. A number of deltaic rivers viz., Salandi, Baitarani, Kansabansa, Gamol, Mantei, Genguti, Kochila, Reba and Kapali pass through and around the district.

This district is divided into three zones according to its soil condition. 1. Saline Soil, 2. Alluvial Soil, and 3. Sandy Soil. This district is

naturally divided into two well-designed tracks. 1. The salt tracks along the coasts which is not arable and 2. The arable track, which is called the granary of the state.

The climate of this district is generally hot and high humid. Max. & min. temperatures are  $42^{\circ}\text{C}$  &  $11.4^{\circ}\text{C}$  respectively. Average annual rainfall of the district is  $1427.9 \text{ mm}$  (15 years average).

**2. Balasore** - Balasore is another important coastal district of Orissa, lies on the northern most part of the state having  $21^{\circ} 03'$  to  $21^{\circ} 59'$  North Latitude &  $86^{\circ} 20'$  to  $87^{\circ} 29'$  East Longitude. Geographical area of the district is  $3634 \text{ Km}^2$ . Bay of Bengal is on the east.

Broadly this district can be divided into three geographical regions, namely,

1. the Coastal belt
2. the inner alluvial plain and
3. the North-Western hills.

The coastal belt – It is about 26 Kms. wide and shapes like a strip. In this region, sand dunes are noticed along the coast with some ridges. The soil of this small strip is saline in nature. This region is mostly flooded with brackish water of estuarine rivers which is unsuitable for cultivation.

The deltaic alluvial plain - It is a wide stretch of highly fertile and irrigated land. The soil of this region is mostly alluvial laterite. The soil of Central region is mostly clay, clay loam and sandy loam which is very fertile for paddy and other farm produces.

The north- western hilly region - Nilgiri Sub-division is mostly gravelly and lateritic soil, which is less fertile. It is mostly hilly terrain and vegetated with tropical semi-ever green forest.

Balasore is crisscrossed with perennial and estuarine rivers because of its proximity to sea. Two important rivers of Orissa, Budhabalanga and Subarnarekha, pass through this district from west to east before surging into the Bay of Bengal.

The climate of Balasore district is mostly hot and humid. The average temperature of the

district varies between 22°C to 32°C and the average rain fall is 1583 mm.

#### MATERIALS AND METHODS

The present study was undertaken in August, 2009 to March, 2012 in different types of soil in different areas of Bhadrak & Balasore district of Orissa. Soil samples were collected during monsoon and winter seasons. 500 gms. of soil samples taken from each plot. The physico-chemical parameter namely temperature, pH & moisture were taken during collection of soil samples.

#### Collection and preparation of slides of protozoa

In laboratory soil samples were cultured. 50-100 gms. of soil were taken into Petridish and distilled water was added to it. Petridish were then kept in sunlight. After 1-2 days' a small drop of water was placed on micro slide and examined through microscope. Testacid of Rhizopod started growing if present in the sample. Soon as the Rhizopodes are seen, the water in the slide is dried by using blotting paper. Thus the specimen is fixed. After fixation 1-2 drops of D.P.X. poured upon the specimen. A cover slip first placed at 45 degree angle upon the specimen and slowly lowered down with the help of a needle, so that D.P.X. will evenly spread devoid of bubbles. We kept this slide for 1-2 days for drying of D.P.X. This permanent slide was then ready for identification.

#### Collection and preservation of Arthropod

For extraction of the soil micro arthropods fauna, 500 gms. of soil sample was put in a modified Tulgren funnel apparatus using 40 watt electric bulb as heat source. The samples were then kept in the funnel for 72 hours. Permanent slides prepared with the extracted fauna for identification.

Apart from extraction we collected expedonic arthropods by sweeping method with a fine net. Later killed with Benzene. Finally separated in different envelope according to order under class insecta.

#### Collection and preservation of earthworm

The living worms were collected by digging soil with a shovel and hand sorting. The worms then dropped in 70 % ethyl alcohol. When the movement of worms stopped, they were removed from alcohol and placed on a piece of blotting paper in straight position. They were then transferred to a flat bottomed container with 10-15% formalin for fixation for 24 hours. The worms were then washed in fresh water and preserved in 70-90% alcohol in suitable sized vials. A label with locality, date of collection and name of collector affixed in each vial.

#### SYSTEMATIC ACCOUNT

##### Phylum I. SARCOMASTIGOPHORA

##### Subphylum SARCODINA

##### Class LOBOSEA

##### Order 1 TESTACEALOBSEA

##### Family 1 ARCELLINIDAE

##### Genus 1 *Arcella* Ehrenberg, 1830

1. *Arcella vulgaris* Ehrenberg.
2. *Arcella discoides* Ehrenberg.
3. *Arcelle catinus* Penard.

##### Family 2 CENTROPYXIDAE

##### Genus 2 *Centropyxis* Stein, 1857

4. *Centropyxis minuta* Deflandre.
5. *Centropyxis spinosa* (Cash & Hopkinson) Deflandre.
6. *Centropyxis arcelloides* (Penard) & Deflandre.

##### Family 3 DIFFLUGIDAE

##### Genus 3 *Diffflugia* Leclerc, 1815

7. *Diffflugia lucida* Penard.
8. *Diffflugia oblonga* Ehrenberg & var. *musicola* var. *nov.*

##### Class FILOSEA

##### Order 2 TESTSCEAFILOSEA

##### Family 4 EUGLYPHIDAE

##### Genus 4 *Euglypha* Dujardin, 1841

9. *Euglypha ciliata* (Ehrenberg).
10. *Euglypha laevis* (Ehrenberg).
11. *Euglypha rotunda* Wailes and Penard.

12. *Euglypha tuberculata* Dujardin.  
Genus 5 *Trinema* Dujardin, 1841
13. *Trinema enchelys* (Ehrensberg) Leidy.  
Phylum II. ANNELIDA  
Class OLIGOCHAETA  
Order 3 HAPLOTAXIDA  
Family 5 MEGASCOLECIDAE  
Genus 6. *Lampito* Kinberg, 1867
14. *Lampito mauritii* Kinberg.  
Genus 7 *Metaphire* Sims & Easton, 1972
15. *Metaphire posthuma* (Vaillant).  
Genus 8 *Perionyx* Perrier, 1872
16. *Perionyx excavatus* Perrier.  
Family 6 OCTOCHAETIDAE  
Genus 9 *Dichogaster* Beddard, 1888
17. *Dichogaster saliens* (Beddard).  
Genus 10 *Eutyphoeus* Michaelsen, 1900
18. *Eutyphoeus orientalis* (Beddard).  
Genus 11 *Lenogaster* Gates, 1939
19. *Lenogaster pusillus* (Stephenson).  
Genus 12 *Octochaetona* Gates, 1962
20. *Octochaetona paliensis* (Stephenson).
21. *Octochaetona surensis* (Michaelsen).  
Genus 13 *Ramiella* Stephenson, 1921
22. *Ramiella bishambari* (Stephenson).  
Genus 14 *Pellogaster* Gates, 1939
23. *Pellogaster bengalensis* Michaelsen.  
Order 4 MONILIGASTRIDA  
Family 7 MONILIGASTRAIDAE  
Genus 15 *Drawida* Michaelsen, 1900  
Phylum III ARTHROPODA  
Class INSECTA  
Order 5 ORIBATIDA  
Family 8 ORIBATELLIDAE  
Genus 16 *Lamellobates* (Hammer)
24. *Lamellobates palustris* (Hammer).  
Order 6 ISOPTERA  
Family 9 TERMITIDAE
- Genus 17 *Odontotermas* Holmgren
25. *Odontotermas feae* (Washman)
26. *Odontotermas obesus* (Rambur).  
Order 7 HYMENOPTERA  
Family 10 VESPIDAE  
Genus 18 *Antepipona*  
Order 8 DIPTERA  
Family 11 SARCOPHAGIDAE  
Genus 19 *Parasarcophaga* Johnston & Tieg
27. *Parasarcophaga* (*Parasarcophaga*) *albiceps* (Meigen).  
Family 12 SYRPHIDAE  
Genus 20 *Mesebrius* Rondani
28. *Mesebrius bengalensis* (Wiedemann).  
Family 13 MUSCIDAE  
Genus 21 *Stemoxys* Geoffroy
29. *Stemoxys calcitrans* (Linnaeus).  
Order 9 HEMIPTERA  
Suborder AUCHENORRHYNCHA  
Infraorder CICADOMORPHA  
Superfamily CERCOPOIDEA  
Family 14 CERCOPIIDAE  
Genus 22 *Poophilus* Stal, 1866
30. *Poophilus costalis* (Walker).  
Superfamily MEMBRACOIDEA  
Family 15 CICAPELLIDAE  
Genus 23 *Neodartus* Melichar, 1903
31. *Neodartus acocethaloides* Melichar.  
Genus 24 *Goniagnathus* Fieber
32. *Goniagnathus punctifer* (Walker).  
Suborder HETEROPTERA  
Infraorder PENTATOMOMORPHA  
Superfamily PENTATOMOIDEA  
Family 16 PENTATOMIDAE  
Genus 25 *Agonoscelis Spin*, 1873
33. *Agonoscelis nubila* (Fabricius).  
Family 17 SCUTELLERIDAE  
Genus 26 *Chrysocoris* Hahn, 1834
34. *Chrysocoris stallii* (Wolff).  
Superfamily COREOIDEA  
Family 18 ALYDIDAE

- Genus 27 *Riptortus* Stal, 1859
35. *Riptortus fuscus* (Fabricius)
- Superfamily LYGOIDEA  
Family 19 LYGAEIDAE
- Genus 28 *Spilostethus* Stal, 1868
36. *Spilostethus hospes* (Fabricius).
- Genus 29 *Metochus* Scot, 1874
37. *Metochus uniguttatus* (Thunberg).
- Superfamily PYRRHOCOROIDEA  
Family 20 PHRRHOCORIDAE
- Genus 30 *Dysdercus* Amy. & Serv., 1843
38. *Dysdercus koenigii* (Fabricius).
- Order 10 ORTHOPTERA  
Family 21 ACRIDIDAE
- Genus 31 *Annulata* Thunbegr 1815
- Genus *Oxya* Serville 1813
39. *Oxya hyla hyla* (Servilla).
- Genus 32 *Oedaleus* Fieber 1853
40. *Oedaleus abruptus* (Thunberg).
- Genus 33 *Trilophidia* Stal 1872
41. *Trilophidia annulata* (Thunberg).
- Family 22 TETTIGONIIDAE
- Genus 34 *Letana* sp. Walker 1869
- Genus 35 *Atractomorpha* Saussure 1862
42. *Atractomorpha crenulata* (Fabricius).
- Genus 36 : *Himertula* Uvarov 1940
43. *Himertula kinneari* Uvarov.
- Order 11 COLEOPTERA
- Family 23 COCCINELLIDAE
- 24 CHRYSOMELIDAE
- 25 TENEBRIONIDAE
- 26 CARCULIONIDAE
- 27 TENEBRIONIDAE
- 28 CARABIDAE
- 29 ELATERIDAE
- 30 DERNESTIAE
- 31 SCARABAEIDAE
- Order 12 COLLEMBOLA
- Family 32 ENTOMOBRYIDAE
- 33 PARONELLIDAE

- 34 ISOTOMIDAE
- 35 SMINTHURIDAE
- Phylum IV MOLLUSCA
- Class GASTROPODA
- Order 13 MESOGASTROPODA
- Superfamily VIVIPAROIDEA
- Family 36 VIVIPARIDAE

Genus 37 *Bellamyia* Jousseau 1886

44. *Bellamyia bengalensis* (Kobelt).

45. *Bellamyia crassa* (Bernson).

Family 37 AMPULLARIIDAE

Genus 38 *Pila* Boltan

46. *Pila globosa* (Swainson).

### SYSTEMATIC ACCOUNT

Phylum I SARCOMASTIGOPHORA

Class LOBOSEA

Order 1 TESTACEALOBOSSEA

Family 1 ARCELLINIDAE

Genus 1 *Arcella* Ehrenberg, 1830 (1832)

1830 (1832) *Arcella* Ehrenberg, *Abh. K. Akad. Wiss Berlin*, p.40.

1 *Arcella vulgaris* Ehrenberg.

1830 (1832) *Arcella vulgaris* Ehrenberg, *Abh. K. Akad. Wiss Berlin*, p.40.

1928. *Arcella vulgaris* Ehrenberg, *Arch. Protistenkd.*, 64, p.219

*Material examined* : 2exs.: Manisai, Dist. Bhadrak; 30.i.2010; A. Murmu & party coll.; 1ex.: Sasanbad village, Dist. Balasore; 23.vi. 2010; D.Saha & party coll.

*Distribution*: India: Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Meghalaya, Manipur, Nagaland, Sikkim, Uttaranchal.

2 *Arcella discoides* Ehrenberg.

1843. *Arcella discoides* Ehrenberg, *Ber. K. Akad. Wiss., Berlin*, p.139.

1928. *Arcella discoides* Ehrenberg : *Deflandre, Arch. protistennkd.*, 64, p.256.

*Material examined* : 1 ex : Manisai, Dist. Bhadrak; 30. i.2010; A. Pal & party coll., 2ex.: Sasanbad village, Dist. Balasore; 23.vi.2010; A. Murmu & party coll.

*Distribution* : India : Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Mizoram, Nagaland, Sikkim Pradesh, Mizoram, Nagaland, Sikkim, West Bengal.

3 *Arcelle catinus* Penard.

1890. *Arcelle catinus* Penard, *Mem. Soc. Phys. & Hist. Nat. Geneva*, p.15.

1928. *Arcelle catinus* Penard : *Deflandre, Arch. Protistenkd.*, 64, p.243.

*Material examined* : 1ex: Manisai, Dist. Bhadrak; 30.i.2010; D. Saha & party coll.

*Distribution* : India: Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Assam, J & K, Sikkim, Uttaranchal.

Family 2 CENTROPYXIDAE

Genus 2 *Centropyxis* Stein, 1857

1857 *Centropyxis* Stein, *Sitz. Bohm. Gesellsch. Wiss.*

4. *Centropyxis minuta* Deflandre.

1929. *Centropyxis minuta* Deflandre, *Arch. protistennkd.*, 67, p.366.

*Material examined* : 1ex: Sanget, Dist. Bhadrak; 06.vii.2011; D. Saha & party coll.

*Distribution* : India: Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Assam, Himachal Pradesh, J & K, Manipur, Nagaland, Uttaranchal, West Bengal.

5. *Centropyxis spinosa* (Cash & Hopkinson).

1929. *Centropyxis spinosa* (Cash & Hopkinson) *Deflandre, Arch. protistennkd.*, 67, p.353.

*Material examined* : 2exs: Joragaria, Dist. Bhadrak; 29.i.2010; D. Saha & party coll. 2exs: Amreya village, Dist. Balasore; 12.ii.2012; D. Saha & party coll. 2exs: Chandipore Jhapar Vilage, Dist. Balasore; 25.vi.2010; D. Saha & party coll.

*Distribution*: India : Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Himachal Pradesh, Mizoram, Sikkim, West Bengal.

6. *Centropyxis arcelloides* (Penard).

1902. *Centropyxis arcelloides* Penard, *Fauna Rhizopodique du basin du Leman, Geneva*, p.309.

1929. *Centropyxis* (Cyclopyxis) *arcelloides* *Deflandre, Arch. protistennkd.*, 67, p.367.

*Material examined* : 1ex: Gelpur village, Dist. Bhadrak; 05.ii.2012; D. Saha & party coll.

*Distribution* : India : Orissa (Dist. Bhadrak & Balasore).

Family 3 DIFFLUGIDAE

Genus 3 *Diffflugia* Leclerc, 1815

1815. *Diffflugia* (partim) *Leclerc, Mem. du Mus.*, 2, p.474.

1958. *Diffflugia* Gauthier-Lievre and Thomas, *Arch. Protistenkd.*, 103, p.240.

7 *Diffflugia lucida* Penard.

1890. *Diffflugia lucida*, Penard *Mem. Soc. Phys. et. Hist. Nat. Geneve*, 31, p.145.

1958. *Diffflugia lucida* : Gauthier-Lievre and Thomas, *Arch. Protistenkd.*, 103, p.294.

*Material examined* : 1ex: Bali Patna Dist. Bhadrak; 05.vii.2011; D. Saha & party coll.

*Distribution* : India : Orissa (Dist. Bhadrak & Balasore), Nagaland, Sikkim, Uttaranchal.

8. *Diffflugia oblonga* Ehrenberg, var. *musicola* var. nov

*Material examined* : 2exs: Sanget, Dist. Bhadrak; 06.vii.2011; D. Saha & party coll.

*Distribution* : India : Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, West Bengal.

Class FILOSEA

Order 2 TESTSCEAFILOSEA

Family 4 EUGLYPHIDAE

Genus 4 *Euglypha* Dujardin, 1841

1841. *Euglypha* Dujardin, *Zooph. Infus.*, p.131.

1915. *Euglypha* : Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.131.

1962. *Euglypha* : Decloitre, *Arch. Protistenkd.*, p.131.

9. *Euglypha ciliata* (Ehrenberg).

1848. *Diffflugia ciliata* Ehrenberg, *Ber. Acad. Berlin*, p.379.

1878. *Euglypha ciliata* Leidy (partim), *Proc. Acad. Philad. Philad.*, p.172.

1915. *Euglypha ciliate* : Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.34.

*Material examined* : 2exs: Sanget, Dist. Bhadrak; 06.vii.2011; D. Saha & party coll.

*Distribution*: India: Orissa (Dist. Bhadrak & Balasore), Assam, J & K, Mizoram, Sikkim, West Bengal.

#### 10. *Euglypha laevis* (Ehrenberg).

1845. *Diffugia laevis* Ehrenberg, *Ber. Akad., Berlin*, p.307.

1849. *Euglypha laevis* Perty, *Mitth. Nat. Ges. Bern.*, p.163.

1915. *Euglypha laevis*: Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.32.

*Material examined* : 1ex : Sreekona, Dist Balasore; 12.ii.2012; D. Saha & party coll.

*Distribution* : India: Orissa (Dist. Bhadrak & Balasore), Megalaya, Sikkim, Tripura, West Bengal.

#### 11. *Euglypha rotunda* Wailes and Penard.

1911. *Euglypha rotunda* Wailes and Penard, *Proc. R. Irish Acad.*, 31, pp.17,41,60-62.

1915. *Euglypha rotunda* : Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.32.

*Material examined* : 1ex : Sreekona, Dist Balasore; 12.ii.2012; D. Saha & party coll.

*Distribution* : India : Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Assam, Himachal Pradesh, Manipur, Tripura, West Bengal.

#### 12. *Euglypha tuberculata* Dujardin.

1841. *Euglypha tuberculata* Dujardin, *Zooph. Infus.* p.251.

1915. *Euglypha tuberculata* : Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.13

*Material examined* : 2exs: Gelpur Village, Dist. Bhadrak ; 05.ii.2012; A. Murmu & party coll.

*Distribution* : India : Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Assam, Himachal Pradesh, Manipur, Tripura, West Bengal.

#### Genus 5 *Trinema* Dujardin, 1841

1841. *Trinema* Dujardin, *Zooph. Infus.*, p.249.

1915. *Trinema*; Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.85.

13. *Trinema enchelys* (Ehrenberg, 1838) Leidy, 1878.

1838. *Diffugia enchelys* Ehrenberg (Pratim), *Infusionsth.*, p.132,

1878. *Trinema enchelys* Leidy, *Proc. Acad. Philad.*, p.172.

1915. *Trinema enchelys* : Cash, Wailes and Hopkinson, *The British Freshwater Rhizopoda and Heliozoa*, 3, p.86.

*Material examined* : 2exs: Gelpur Village, Dist. Bhadrak; 05.ii.2012; A. Pal & party coll.

*Distribution* : India: Orissa (Dist. Bhadrak & Balasore), Andhra Pradesh, Manipur, Mizoram, Nagaland, West Bengal.

PHYLUM II ANNELIDA  
Class OLIGOCHAETA  
Order 3 HAPLOTAXIDA  
Family 5 MEGASCOLECIDAE

#### Genus 6 *Lampito* Kinberg, 1867

1867. *Lampito* Kinberg, *Ofvers. K. Vetens. Akad. Forhandl. Stockholm*, 23; 103.

1987. *Lampito* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.92:8*

#### 14. *Lampito mauritii* Kinberg.

1867. *Lampito mauritii* Kinberg, *Ofvers.K. Vetens. Akad. Forhandl. Stockholm*, 23; 103.

1938. *Lampito mauritii* : Gates, *ibid.*, 40: 413

1987. *Lampito mauritii* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.92:9*

*Material examined* : 10 exs.: Dist. Jharnahati vill., Balasore; 26.i.2010; A. Murmu coll.; 11exs.: Uttarbahini, Bhadrak Dist.; 05.vii.2011; R.Goswami coll. 6exs.: Langudi vill., Bhadrak Dist.; 07.ii.2012; A.Pal coll.

*Distribution* : India: Orissa. (Dist.-Bhadrak & Balasore), Andaman and Nicobar Island, Andhra Pradesh, Bihar, Gujrat, Karnataka, Kerala, Laccadive & Minicoy Islands, Madhya Pradesh, Maharastra, Rajasthan, Tamilnadu, Uttarpradesh, West Bengal.

*Remarks* : It is widely distributed throughout India, though originally assumed to be Peninsular India.

#### Genus 7 *Metaphire* Sims & Easton, 1972

1972. *Metaphire* Sims & Easton, *Biol. J. Linn. Soc.*, 4(3) : 215

1987. *Metaphire* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No. 92:10*

#### 15. *Metaphire posthuma* ( Vaillant).

1868. *Perichaeta posthuma* Vaillant, *Annl Sci. Nat.*, (ser.5), 10: 228.

1972. *Metaphire Posthuma* : Sims & Easton, *Biol. J. Linn. Soc.*, 4(3): 239.

1980. *Metaphire Posthuma* : Soota & Halder, *Rec. Zool. Surv. India*, 76:200.

*Material examined* : 9 exs. : Sasanbad vill., Dist. Balasore; 25.vi.2011; R. Goswami coll.

*Distribution* : India: Orissa (Balasore Dist.), Andaman Island, Bihar, Gujrat, Haryana, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Maharastra, Punjab, Rajasthan, Uttar Pradesh, West Bengal.

*Remarks* : Species originated in south east Asia, widely distributed.

#### Genus 8 *Perionyx* Perrier, 1872

1872. *Perionyx* Perrier, *Nouv. Arch. Mus. Hist. nat. parts.* 8: 126.

1987. *Perionyx*: Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.92:13.*

#### 16. *Perionyx excavatus* Perrier.

1872. *Perionyx excavatus* Perrier. *Nouv. Arch. Mus. Hist. nat. parts.* 8:126.

1987. *Perionyx excavatus* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.92:13.*

*Material examined* : 5exs.: Dist. Bhadrak; 07.vii.2011; R. Goswami coll.; 5 exs.; Bhuipada Dist. Balasore ; 11.ii.2012; A. Pal coll.

*Distribution* : India : Orissa ( Dist. Bhadrak & Balasore), Andaman Island, Arunachal Pradesh Assam, Himachal Pradesh, Maharastra, Manipur, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

*Remarks* : This species originated from the Himalayas.

#### Family 6 OCTOCHAETIDAE

#### Genus 9 *Dichogaster* Beddard, 1888

1888. *Dichogaster* Beddard, *Quast. I. miscrsc. Sci.* (n.s.) 29:251

1987. *Dichogaster* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No. 92: 21.*

#### 17. *Dicogaster saliens* (Beddard).

1893. *Micridilus saliens* Beddard, *Proc. Zool. Soc. Land*, 1892: 683.

1900. *Dichogaster saliens* : Stephenson, *Ibid.* : 478.

1972. *Dichogaster saliens* : Gates, *Trans. Am. Phil. Soc.*, 62(7) : 281

*Material examined* : 13exs. : Balipatna, Dist. Bhadrak; 05.vii, 2011.; R. Goswami coll.

*Distribution* : India : Orissa (Dist -Bhadrak ), Arunachal Pradesh, Karnataka, Meghalaya, Sikkim, West Bengal.

*Remarks* : Probably originated from West Africa and rare in India.

#### Genus 10 : *Eutyphoeus* Michaelsen 1900

1900. *Eutyphoeus* Michaelsen, *Das Tierreich*, 10: 322.

1987. *Eutyphoeus*: Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No. 92:25.*

#### 18. *Eutyphoeus orientalis* (Beddard).

1833. *Eutyphoeus orientalis* Beddard, *Ann. Mag. nat. Hist.*, (ser.5). 12:219.

1938. *Eutyphoeus orientalis* : Gates, *Rec. Indian Mus.*, 40: 98.

1966. *Eutyphoeus orientalis*: Soota, *Rec. Zool. Surv. India*, 64:179.

*Material examined* : 9 exs.: Singla vill, Dist. Balasore; 28.i.2010; A. Murmu coll.

*Distribution* : India: Orissa ( Dist. Balasore), Bihar, Uttar Pradesh, West Bengal.

*Remarks* : This is endemic species.

#### Genus 11 *Lenogaster* Gates 1939

1939. *Lenogaster* Gates. *Rec. Indian Mus.*, 41:183.

1987. *Lenogaster* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No. 92:27.*

#### 19. *Lenogaster pusillus* (Stephenson).

1920. *Eudichogaster pusillus* Stephenson, *Mem. Indian Mus.*

1945. *Lenogaster pusillus* : Gaters, *Proc. Indian Acad. Sci.*, 21 (B) :252.

1987. *Lenogaster pusillus* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No. 92: 27.*

*Material examined* : 57exs.: Balipatna, Bamkura, Sanget, Uttarbahini, Dist. Bhadrak; 05.vii.2011 and 06.vii.2011. R. Goswami coll.; 37 exs.: Bhuipada, Sreekona, Dist. Balasore; 11.ii.2012 and 12.ii.2012.; A. Pal coll.



*Distribution* : India : Orissa (Dist. Bhadrak & Balasore), Himachal Pradesh, Karnataka, Madhya Pradesh, Uttar Pradesh, West Bengal.

Genus 12 *Octochaetona* Gates 1962

1962. *Octochaetona* Gates, *Ann. Mag. nat. Hist* (Ser.13), 5: 211.

1987. *Octochaetona* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.* 92:28.

20. *Octochaetona paliensis* (Stephenson).

1907. *Octochaetus phillotti* Michaelsen, *Jb. Hamb. Wiss. Anst.*, 24:169.

1920. *Octochaetus paliensis* Stephenson, *Mem. Indian Mus.*, 7:228.

1962. *Octochaetona paliensis*, Gates, *Ann. Mag. Nat. Hist.* (ser.13), 5:213.

*Material examined* : 2exs.: Karali, Dist. Balasore; 09.vii.2011; R. Goswami coll.

*Distribution* : India: Orissa (Dist. Balasore), Andhra Pradesh, Madhya Pradesh, Maharashtra.

21. *Octochaetona surensis* (Michaelsen).

1910. *Octochaetona surensis* Michaelsen, *Abh. Geb. Natural., Hamburg.* 19 (5) :8.

1962. *Octochaetona surensis*, Gates, *Ann. Mag. nat. Hist.* (ser.13), 5:213.

1972. *Octochaetona surensis*, Gates, *Trans. Am. phil. Soc.*, 62:309.

*Material examined* : 8 exs.: Kenduapada vill., Dist. Bhadrak; 08.ii.2012; A. Pal coll.

*Distribution* : India : Orissa (Dist-Bhadrak), Assam, Madhya Pradesh, Uttar Pradesh.

Genus 13 *Ramiella* Stephenson 1921

1921. *Ramiella* Stephenson, *Proc. zool. soc Land*, 1921 : 109

1987. *Ramiella*: Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.* 92:34.

22. *Ramiella bishambari* (Stephenson).

1914. *Octochaetus bishambari* Stephenson, *Rec. Indian Mus.*, 10; 347.

1923. *Ramiella bishambari* : Stephenson, *Fauna. Br. India, Oligochaeta.*: 398.

1987. *Ramiella bishambari*: Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.* 92: 35.

*Material examined* : 2exs. : Gopinath temple, Dist. Balasore; 09.vii.2011; R. Goswami coll.

*Distribution* : India : Orissa (Dist-Balasore), Andaman & Nicobar Island, Madhya Pradesh, Uttar Pradesh, West Bengal.

*Remarks* : Originated from the sub Himalayan region.

Genus 14 : *Pellogaster* Gates, 1939

1939. *Pellogaster* Gates, *Rec Indian. Mus.*, 41 : 200.

1987. *Pellogaster* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.* 92:33.

23. *Pellogaster bengalensis* (Michaelsen).

1910. *Eudichogaster bengalensis* Michaelsen, *Abh. Geb. Naturw., Hamburg*, 19 : 96.

1939. *Pellogaster bengalensis* Gates, *Rec. Indian Mus.* 41 : 201.

1987. *Pellogaster bengalensis* : Julka & Senapati, *Rec. Zool. Surv. India, Occ paper No.* 92 : 34.

*Material examined* : 8exs.: Jaleswar, Dist. Balasore; 25.vi.2010; A. Murmu coll.

*Distribution* : India : Orissa (Dist-Balasore), Bihar, Madhya Pradesh.

*Remarks* : This species is endemic to India.

Order 4 MONILIGASTRIDA

Family 7 MONOLIGASTRAIDAE

Genus 15 *Drawida* Michaelsen 1900

1900 *Drawida* Michaelsen, *Das Tirreich, Berlin*, 10; 114.

1987 *Drawida* : Julka & Senapati, *Rec. Zool. Surv. India, Occ. Paper No.* 92 : 37.

*Material Examined* : 7exs. : Chandbali, Dist. Bhadrak; 27.i.2010; A. Murmu. coll. 2exs.: Arjunpur, Dist. Bhadrak; 06.vii.2011; R. Goswami coll.

*Distribution* : India : Orissa (Dist. Bhadrak), West Bengal.

Phylum III ATRHROPODA

Class INSECTA

Order 5 ORIBATIDA

Family 8 ORIBATELLIDAE

Genus 16 *Lamellobates* Hammer

24. *Lamellobates palustris* Hammer.

1968. *Lamellobates palustris* Hammer, *Arges. Bot. Diol. SKR. DAN. VZE. SEL. SK*, p.10

*Material examined* : 12 exs.: Gelpur vill., Dist. Bhadrak; 04.ii.2012; A. Pal coll.

*Distribution* : India : Orissa (Dist. Bhadrak), W.B.

Order 6 ISOPTERA  
Family 9 TERMITIDAE

Genus 17 *Odontotermes*

25. *Odontotermes obesus* (Rambur).

1842. *Termes obesus* Rambur, *Histoire nat. Insectes, Neuropteres*: 304.

2010. *Odontotermes obesus* (Rambur): Saha, Roy and Sar, *Zool. Surv. India, Fauna of Uttarakhand, State Fauna Series*. 18 (Part-2) :83,94,98.

*Material examined* : 2 exs.: Chandbali, Dist. Bhadrak; 26.i.2010; A.Murmu. coll.

*Distribution* : India : Orissa (Dist. Bhadrak), Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Manipur, Tripura.

26. *Odontotermes feae* (Wasmann).

1896. *Termes feae* Wasmann *Ann. Mus. Star. Nat. Geneva*, (2) 16 (360; 625,626. Sand W.

2010. *Odontotermes feae* (Wasmann): Saha, Roy and Sar, *Zool. Surv. India, Fauna of Uttarakhand. State Fauna Series*, 18 (Part-2) : 82,93.9.

*Material examined* : Chandbali, Dist. Bhadrak; 26.i.2010; A. Murmu. coll.

*Distribution* : India : Orissa (Dist. Bhadrak), Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Manipur, Tripura.

Order 7 HYMENOPTERA  
Family 10 VESPIDAE

Genus 18 *Antepipona*. Sp.

Order 8 DIPTERA  
Family 11 SARCOPHAGINAE

Genus 19 *Parasarcophaga* Johnston and Tiegs

1921. *Parasarcophaga* Johnston and Tiegs, *Proc. R. Soc. Qd.* 33 : 86.

27. *Parasarcophaga albiceps* (Meigen).

1826. *Sarcophaga albiceps* Meigen, *Syst. Bechr. europ. zeeifl. Insect.* 5:22.

*Material examined* : 1 ex.; Jitunauga, Dist. Bhadrak; 04.ii.2012; A. Pal & Party coll.

*Distribution* : India: Orissa (Bhadrak), Bihar, Karnatak, Kerala, Madhya Pradesh, Tamil Nadu, West Bengal.

Family 12 SYRPHIDAE

Genus 20 : *Mesembrius* Rondani

1857. *Mesembrius Rondani*, *Diptenol. ital. Prodr.* 2.p. 50.

28. *Mesembrius bengalensis*. (Wiedemann).

1819. *Eristalis bengalensis*. Wiedemann, *Zool. Mag. (wied.)* 1:16.

*Material examined* : 2 exs.: Soro, Dist. Balasore; 10.ii.2012; A.Pal & Party coll.

*Distribution* : India : Orissa (Dist. Balasore), Assam, Bihar, Meghalaya, M.P, Oriental Region.

Family 13 MUSCIDAE

Genus 21 *Stomoxys* Geoffroy

1762. *Stomoxys* Geoffroy, *Hist. abreg. Ins. Paris.* 2; 449.

29. *Stomoxys calcitrans* (Linnaeus).

1758. *Conops calcitrans* Linnaeus, *Syst. Nat. Ed.*, 10, 1 : 604.

*Material examined* : 1 ex; Soro, Dist. Balasore; 10.ii.2012; A.Pal & Party coll.

*Distribution* : India : Orissa (Dist. Balasore), Assam, Bihar, Madhya Pradesh, South India.

Order 9 HEMIPTERA  
Infraorder CICADOMORPHA  
Family 14 CERCOPIDAE

Genus 22 *Poophilus* Stal, 1866

1866. *Poophilus* Stal, Hem

30. *Poophilus costalis* (Walker)

1851. *Ptyelus costalis* Walker, *List. Hem.*, 3: 707.

1908. *Poophilus costalis*: Distant, *Fauna Brit. India, Rhynchota*, 4:86.

*Material examined* : 1ex., Sara, Dist., Balasore, 10.2.12, coll. A. Pal and party.

*Distribution* : India : Orissa (Balasore), Andhra Pradesh, Karnataka, Maharashtra, Meghalaya.

*Elsewhere*: Bangladesh, Singapore, Sri Lanka, South & West Africa.

Superfamily MEMBRACOIDEA  
Family 15 CICAPELLIDAE

Genus 23 *Neodartus* Melichar, 1903

1903. *Neodartus* Melichar, *Hom. Fauna Ceylon*: 162.

31. *Neodartus acocethaloides* Melichar

1903. *Neodartus acocethaloides* Melichar, *Hom. Fauna Ceylon*: 163.

1200. *Neodartus acocethaloides*: Ghosh and Biswas, *State Fauna Series 7: Fauna of Tripura*, part-2: 326.

*Material examined* : 2 exs., Basudevapur, Dist. Bhadrak, 22.vi.2010, coll. A. Murmu and party.

*Distribution*: India: Orissa (Bhadrak), Punjab, Tamil Nadu, Tripura, West Bengal, *Elsewhere*: Philippines.

Genus 24 *Goniagnathus* Fieber, 1866

1866. *Goniagnathus* Fieber, *Verh. Z.b.Ges. Wien.*, 16:506.

32. *Goniagnathus punctifer* (Walker).

1858. *Bythoscopus punctifer* Walker, *Insecta Saundersim* : 108.

2007. *Goniagnathus punctifer*: Ghosh and Bal, *State Fauna Series 5: Fauna of Andhra Pradesh*, part-3: 293.

*Material examined* : 4 exs., Basudevapur, Dist. Bhadrak, 22.vi.2010, coll. A. Murmu and party.

*Distribution* : India : Orissa (Bhadrak), Andhra Pradesh, Assam, Bihar, Maharashtra, Meghalaya, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

*Elsewhere*: Maldives, Myanmar, Sri Lanka.

Suborder HETEROPTERA  
 Infraorder CICADOMORPHA  
 Superfamily PENTATOMOIDEA  
 Family 16 PENTATOMIDAE

Genus 25 *Agonoscelis* Spin, 1873

1873. *Agonoscelis* Spin.

33. *Agonoscelis nubila* (Fabricius).

1775. *Cimex nubile* Fabricius: *Syst. Ent.*, :712.

1904. *Agonoscelis nubila*: Distant, *Fauna Brit. India, Rhynchota*, 1:58.

*Material examined* : 1ex. Bhuipada, Dist. Bhadrak, 11.2.12, coll. A. Pal and party.

*Distribution*: India: Orissa (Bhadrak), Andhra Pradesh, Bihar, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu, West Bengal. *Elsewhere*: Myanmar, China, Japan, Malayan Peninsula, Sri Lanka.

## Family 17 SCUTELLERIDAE

Genus 26 *Chrysocoris* Hahn, 1834

1843. *Chrysocoris* Hahn, *Wanz. Ins.*, 2:38.

34. *Chrysocoris stollii* (Wolff.).

1801. *Cimex stollii*: Wolff., *l.c.*, 2:48.

1904. *Chrysocoris stollii* Distant, *Fauna Brit. India, Rhynchota*, 1:58.

*Material examined* : 6exs., Chandbali, Dist. Bhadrak, 27.1.10, coll. A. Murmu and party.

*Distribution* : India : Orissa (Bhadrak), Tripura, West Bengal and throughout the country.

*Elsewhere* : China, Myanmar.

## Superfamily COREROIDEA

## Family 18 ALYDIDAE

Genus 27 *Riptortus* Stal, 1859

1859. *Riptortus* Stal, *Ofv. Vet.-Ak. Forh.*, : 400.

35. *Riptortus fuscus* (Fabricius).

1798. *Lygaeus fuscus*: Fabricius, *Ent. Syst. Suppl.*, 539.

1904. *Riptortus fuscus* Distant, *Fauna Brit. India, Rhynchota*, 1:414.

*Material examined*: 1ex., Basudevapur, Algoda, Dist. Bhadrak, 23.vi.10, coll. A. Murmu and party.

*Distribution* : India : Orissa (Bhadrak).

## Superfamily LYGOIDEA

## Family 19 LYGAEDAE

Genus 28 *Spilostethus* Stal, 1868

1868. *Spilostethus* Stal, *Kongl. Svensk. Vet. Akad. Handl.*, 7(11):72

36. *Spilostethus hospes* (Fabricius)

1794. *Lygaeus hospes*: Fabricius, *Ent. Syst.*, 4:150.

1988. *Spilostethus hospes* Mukhopadhyay, *Rec. Zool. Surv. India, Occ. Paper No.* 107:15.

*Material examined* : 2exs., Chandbali, Dist. Bhadrak, 27.i.10, coll. A. Murmu and party, 6exs. Chandipur P.W.D. Bungalow, Dist. Balasore, 17.vi.10, coll. A. Murmu and party.

*Distribution* : India: Orissa (Balasore, Bhadrak), Maharashtra, Tamil Nadu, Uttarakhand, Tamil Nadu.

Genus 29 *Metochus* Scott, 1874

1874. *Metochus* Scott, *Ann. Mag. Nat. Hist.*, (4) 14: 433-434.

37. *Metochus uniguttatus* (Thunberg)

1822. *Pendulinus uniguttatus* Thunberg, *Hem. Rost. Cap.*, 4:6.

1904. *Metochus uniguttatus* : Mukhopadhyaya, *Rec. Zool. Surv. India, Occ. Paper No.107*: 56.

*Material examined* : 1ex., Chandbali, Dist. Bhadrak, 27.i.10, coll. A. Murmu and party.

*Distribution* : India : Orissa (Bhadrak), Andaman Islands, Maharashtra, Meghalaya, Uttaranchal, West Bengal. Elsewhere: China, Myanmar, Malay Archipelago, Sri Lanka.

## Superfamily PYRRHOCOROIDEA

## Family 20 PYRRHOCORIDAE

Genus 30 *Dysdercus* Amy. & Serv., 1843

1843. *Dysdercus* Amy. & Serv., *Hem.*, : 272.

38. *Dysdercus koenigii* (Fabricius)

1775. *Cimex cingulatus* Fabr., *Syst. Ent.*, : 719.

2007. *Dysdercus koenigii* Saha & Bal, *State Fauna Series 18, Fauna of Uttarakhand*: 248.

*Material examined* : 3exs., Chandbali, Dist. Bhadrak, 27.i.10, coll. A. Murmu and party, 1ex. Baripada, Dist. Bhadrak, 11.ii.12, coll. A. Pal and party.

*Distribution* : India: Orissa (Bhadrak), Andhra Pradesh, Assam, Andaman & Nicobar Islands, West Bengal.

*Elsewhere*: Sri Lanka.

## Order 10 ORTHOPTERA

## Family 21 ACRIDIDAE

Genus 31 *Oxya* Serville, 183139. *Oxya hyla hyla* (Serville).

1831. *Oxyahyla* Serville, *Ann. sci. nat. (Zool.)*, Paris, 22: 287.

2006. *Oxya hyla hyla*: Shishodia, *Binotes*, 81: 11.

*Material examined* : 5 exs.; Remuna & Singla, Dist. Balasore; 04.ii.2010; A. Murmu.

*Distribution* : India : Orissa (Dist. Balasore), Andaman, Nicobar, A.P., Arunachal Pradesh, Bihar, M.P., Haryana, Gujrat, U.P., W.B.

Genus 32 : *Oedaleus* Fieber 185340. *Oedaleus abruptus* (Thunberg).

1815. *Gryllus abruptus* Thunberg, *Mem. Acad. Soc. St. Petersburg*, 5: 233.

1981. *Oedaleus abruptus* : Ritchie, *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42(3): 104.

*Material examined* : 1ex.; Basudebpur, Dist. Bhadrak; 21.vi.2010; A. Murmu.

*Distribution* : India : Orissa (Dist. Bhadrak), Andhra Pradesh, Bihar, H. P., J & K, M.P. Rajasthan, T.N., Tripura, U.P., W.B.

Genus 33 *Trilophidia* Stal, 187241. *Trilophidia annulata* (Thunberg).

1815. *Gryllus annulatus* Thunberg, *Mem. Acad. Sci. Siptersb*, 5: 234.

1965. *Trilophidia annulata*: Hollis, *Trans. R. ent. Soc.* 117(8:251).

*Material examined* : 3exs.; Tihidi, Dist. Bhadrak; 20.vi.2010; A. Murmu coll.

*Distribution* : India : Orissa (Dist. Bhadrak), A.P., Arunachal Pradesh, Bihar, Kerala, Manipur, Himachal Pradesh, Tamilnadu, Tripura, W.B.

## Family 22 TETTIGONIIDAE

Genus 34 *Atractomorpha* Saussure, 186242. *Atractomorpha crenulata crenulata* (Fabricius)

1793. *Truxalis crenulatus* Fabricius, *Ent. Syst.*, 2: 28.

1960. *Atractomorpha crenulata crenulata* : Banerjee & Keven, *Treubia*, 25: 184.

*Material examined* : 2exs.; Soro, Dist. Balasore; 10.ii.2012; A. Pal coll.

*Distribution* : India : Orissa (Dist. Balasore), Andaman & Nicobar Islands, Andhra Pradesh, Bihar, J & K, Karnataka, Madhya Pradesh, Rajasthan, Tamilnadu, W.B.

Genus 35 : *Himertula* Uvarov, 194043. *Himertula kinneari* (Uvarov)

1923. *Himertula kinneari* Uvarov, *J. Bom. Nat. Hist. Soc.*, 29(3:661).

2007. *Himertula kinneari* : Chandra *et. al.*, *Zoos. Print. Journl.*, 27 (5: 2684).

*Material examined* : 3Exs. Kenduapada, Dist. Bhadrak; 08.ii.2012; A. Pal. coll.

*Distribution* : India : Orissa (Dist. Bhadrak), Bihar, Chhattishgarh, M.P., Gujarat, Himachal Pradesh, Maharashtra, Uttar Pradesh, W.B.

Phylum IV MOLLUSCA  
Class GASTROPODA  
Order 13 MESOGASTROPODA  
Family 36 VIVIPARAIDAE

Genus 36 *Bellamyia* Jousseume, 1886

44. *Bellamyia bengalensis* (Kobalt).

1908. *Viviparaannandalei* Kobalt, *Malak. Ges.*, 60: 161.

2005. *Bellamyia bengalensis*: Mitra, Dey & Ramakrishna, *Fauna of A. P. : State Fauna Series*, Part 5 :190.

*Material examined* : 17Exs. Sreekona, Dist. Balasore, 12.ii.2012; A.Pal & Party coll : 4Exs, Langudi, Dist. Bhadrak; 07.ii.2012; A.Pal & Party.

*Distribution* : India : Orissa (Dist. Balasore & Bhadrak), Andhra Pradesh, Bihar, Jharkhand, Manipur, Meghalaya, Rajasthan, Tamilnadu, W.B.

45. *Bellamyia crassa* (Benson).

1836. *Paludina crassa* (Benson), *J. Saïat. Soc. Beng.* 5 :745.

2005 *Bellamyia crassa* : Mitra, Dey & Ramakrishna, *Fauna of A.P., State Fauna Series*, Part 5, p.190.

*Material examined* : 12exs. Soro, Dist. Balasore, 12.ii.2012; A.Pal & Party coll: 5Exs; Langudi, Dist. Bhadrak : 07.ii.2012; A.Pal & Party.

*Distribution* : India : Orissa (Dist. Balasore, Bhadrak) Assam, A.P., Karnataka, Meghalay, Gujrat, West Bengal.

Family 37 AMPULLARIIDAE

Genus 37 *Pila* Boltan, 1798

46. *Pila globosa* (Swainson).

1822. *Ampullaria globosa* Swainson, *Zool. Illustration*, 21: pl.xix.

1889. *Pila globosa*; Subbarao, *Hand book of fresh water Molluscs of India*, p.58, Fig. 80-82.

*Material examined* : 5exs; Sreekona, 3exs., Bhuipada, Dist. Balasore 11. ii.2012; A.Pal & Party coll. 10Exs.; Langudi, Dist. Bhadrak, 07. ii.2012 A. Pal & Party coll.

*Distribution* : India : Orissa (Dist. Bhadrak, Balasore), Assam, Bihar, H.P., Jharkhand, Maharashtra, M.P., Meghalay, U.P., Rajasthan, W.B.

### SUMMARY

The paper deals with the studies of soil fauna in different habitats of two districts of Orissa, namely, Bhadrak & Balasore during the period from August 2009 to March 2012. The work consists of taxonomic study of soil fauna. The purpose of study is to identify the diversity of soil fauna that inhabit in different soil types and also different soil insects collected from this soil. The paper deals with introduction, functions of soil fauna in soils, topographical speciality of the study areas, materials & methods, taxonomical details and summery. The material collected is represented by 46 species belonging to 38 genera and 37 families under 13 orders of 4 phyla. The break up of all the species under the fauna collected is given here to show the groupwise strength of the species, genus, family and order. The result shows that all the species have new locality records. Among the fauna *Centropyxis spinosa* in protozoa, *Lenogaster pusillus* in earthworm and order Hemiptera in Arthropoda occupied highest number and found in all seasons and shows the dominance. Necessary taxonomic reference to original literature, remarks wherever possible and geographical distribution of each species are incorporated. The paper is based on the collection made by various survey parties of Soil Zoology section of Zoological Survey of India.

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