



Oribatid Mite (Acari: Oribatida) Fauna of Konkan, Maharashtra, India with New Records

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ABSTRACT: The present work deals with a collection of soil oribatid mites from some selected habitat of five districts of Konkan Region of the Maharashtra state. 18 species, 17 genera belonging to 13 families of soil oribatid mites were recorded from the present investigation. As this region is totally unexplored all the species and genera found are new records from the Maharashtra state with 2 new records from India.

Key words: Oribatid mites, Konkan region, Maharashtra, new records.

INTRODUCTION

Although tiny themselves, mites belong to most impressive lineage of animals, the arthropods. They are ubiquitous in every sort of aquatic, terrestrial, arboreal and parasitic habitat but, being among the smallest arthropods, even those inhabiting well studied systems are often overlooked. It is estimated that there are about 9000 species of soil oribatid mites belonging to 800 genera are presently known from the world.

When compared the state Maharashtra is so far known to comprise only 4 Oribatid species belonging to 3 genera and 2 families as against 2186 species belonging to 643 genera and 207 families reported from India. Narsapur (1983) made the first record of Oribatid mite from Maharashtra from the soils of the state. Later Sanyal (1984) studied soil mites of Maharashtra and published one paper containing description of two new species. No work has been done on soil oribatid mites after that.

The present paper is based on a Collection of soil oribatid mites from the Konkan region of the state Maharashtra. An account of 18 species, 17 genera belonging to 13 families are provided here, with details of collection data. The oribatid fauna of this region is practically unexplored and the present account will form a basis for future research on this group from the area.

Konkan division is one of the six administrative divisions of Maharashtra state in India. It comprises the Konkan region, which occupies the entire west coast of Maharashtra. The two districts in the state capital Mumbai also fall in Konkan division. The total area comprises 30,746 km² and districts Mumbai, Mumbai Suburban, Raigad, Ratnagiri, Sindhudurg and Thane. Collections were made from soil and litter from different habitats.

MATERIAL AND METHODS

For taxonomic studies of oribatid mites, litter, soil and humus samples from all possible habitats were collected. The samples Collected by shovel from upper 10 cm soil profile were kept in polythene bags. The samples were extracted by using modified Tullgren funnels and extracted mite specimens were collected in glass tubes containing 70% alcohol.

The body of most of the oribatid mite is heavily sclerotized and opaque. The extracted material were made ready for taxonomic study following the usual procedure of keeping the specimen in solution of 90% alcohol and lactic acid (v/v) as advocated by Balogh (1965). For microscopic observations, Balogh's (1965) method of temporary mounting in lactic acid was followed. After necessary microscopic observations the specimen was transferred in small glass vials containing 90% alcohol. The vials were then properly labelled and stored.

The specimens were studied under Nikon Eclipse, 50i microscope. In this study, the classification proposed by Balogh (1972) has been followed.

All specimens are deposited in the National Zoological Collections of Zoological Survey of India, HQs., Kolkata.

Study Area: The districts of Konkan Region (Marked in red) of Maharashtra were surveyed.

RESULTS

SYSTEMATIC ACCOUNT

1. Family: PHTHIRACARIDAE Perty, 1841

1. Genus: *Hoplophorella* Berlese, 1923

1923. *Hoplophorella* Berlese, *Redia*, **25**: 260.

1. *Hoplophorella scapellata* Aoki, 1965

1965. *Hoplophorella scapellata* Aoki, *Nat. Life Southeast Asia*, **4**:131.

- Material Examined:** 1, Varsoli Sea Beach, Raigad, Maharashtra, 21.ix.2013 from soil & litter, Coll. S. Acharya, 4979/17/ZSIHQ.
- Distribution:** India: West Bengal, Bihar, Manipur.
2. Family: LOHMANIDAE Berlese, 1916
2. Genus: *Annectacarus* Grandjean, 1950 1950. *Annectacarus* Grandjean, *Arch. Zool. exp. gen. Paris*, **87**:131
2. *Annectacarus* sp.
- Material Examined:** 1, Aarey colony, Mumbai, Maharashtra, 13.ix.2013 from Soil & Litter, Coll. S. Acharya, 4962/17/ZSIHQ.
3. Genus: *Javacarus* Balogh, 1961
1961. *Javacarus* Balogh, *Acta. Zool. Acad. Sci. Hung.*, **7**: 24
3. *Javacarus* sp.
- Material Examined:** 1, Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil & Litter, Coll. S. Acharya, 4981/17ZSI HQ ; 1, Varsoli Sea Beach, Raigad, Maharashtra, 21.ix.2013 from soil & litter, Coll. S. Acharya, 4982/17 ; 1, Nagaon Village, Raigad, Maharashtra, 17.ix.2013 from Soil & Litter, Coll. S. Acharya, 4983/17/ZSIHQ.
3. Family: TRHYPOCHTHONIDAE Willman, 1931
4. Genus: *Allonothrus* Van der Hammen, 1953
1953. *Allonothrus* Hammen, *Proc. Acad. Sci. Amst.*, **56C**: 244.
4. *Allonothrus russeolus russeolus* Wallwork, 1960
1960. *Allonothrus russeolus* Wall work *Acarologia*, **2**(4): 571
- Material Examined:** 1, Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 4961/17/ZSIHQ.
- Distribution:** India: West Bengal, Assam.
4. Family: GYMNODAMAEIDAE Grandjean, 1954
5. Genus: *Gymnodamaeus* Kulczynski, 1902 (= *Plesiodamaeus* Grandjean, 1954)
1954. *Plesiodamaeus* Grandjean, *Bull. Soc. zool. France*, **78**: 421-446.
5. *Gymnodamaeus glaber* (Mihel i, 1957) (= *Plesiodamaeus glaber* Mihel i, 1957)
1957. *Plesiodamaeus glaber* Mihelcic, *Zool. Anz.*, **159**: 41-68.
- Material Examined:** 2, Ratnagiri Fort, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 4992/17/ZSIHQ; 1, Majiwara, Thane, Maharashtra, 16.ix.2013 from Soil and litter, Coll. S. Acharya, 4993/17/ZSIHQ.
- Remarks:** The species is recorded for the first time from India.
5. Family: MICROZETIDAE Grandjean, 1936
6. Genus: *Orthozetes* Balogh, 1962
1962. *Orthozetes* Balogh, *Opusc. Zool. Budapest*, **4**: 35-38.
6. *Orthozetes dispar* Balogh, 1962
1962. *Orthozetes* Balogh, *Opusc. Zool. Budapest*, **4**: 35-38.
- Material Examined:** 1, Ratnagiri Fort, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 4990/17/ZSIHQ.
- Remarks:** The species is recorded for the first time from India.
6. Family: EREMOBELBIDAE Balogh, 1961
7. Genus: *Eremobelba* Berlese, 1908s
1908. *Eremobelba* Berlese, *Redia*, **5**(1): 9.
7. *Eremobelba* sp.
- Material Examined:** 3, Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil & Litter, Coll. S. Acharya, 4965/17ZSI HQ.
7. Family: BASIOBELBIDAE Balogh, 1961
8. Genus: *Basilobelba* Balogh, 1958
1958. *Basilobelba* Balogh, *Rev. Zool. Bot. Afr.*, **58**: 9.
8. *Basilobelba* sp.
- Material Examined:** 1, Dadar Railway Colony, Mumbai, Maharashtra, 13.ix.2013 from soil and litter, Coll. S. Acharya, 4963/17/ZSIHQ.
8. Family: TECTOCEPHEIDAE Grandjean, 1954.
9. Genus: *Tectocephus* Berlese, 1896
1896. *Tectocephus* Berlese, *Acari Myriopoda et Scorpioneshucusque in Italia reperta. Ordo Cruptostigmata (Oribatidae. (Cryptostigmata II)*. Portici.
9. *Tectocephus velatus* (Michael, 1880)
1880. *Tectocephus velatus* (Michael), *Journ. Roy. Micr. Soc.*, **3**(2): 190
- Material Examined:** 1, Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil & Litter, Coll. S. Acharya, 5029/17ZSI HQ; 1, Kihim Village, Raigad, Maharashtra, 22.ix.2013 from Soil and litter, Coll. S. Acharya, 5030/17/ZSIHQ.
- Distribution:** India: West Bengal, Orissa, Bihar, Himachal Pradesh, Sikkim.
9. Family: OPPIIDAE Grandjean, 1951
10. Genus: *Brachioppiella* Hammer, 1962
1962. *Brachioppiella* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13**: 1-17.
10. *Brachioppiella periculosa* Hammer, 1962
1962. *Brachioppiella* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13**: 1-17.
- Material Examined:** 1, Aarey colony, Mumbai, Maharashtra, 13.ix.2013 from Soil and Litter, Coll. S. Acharya, 4964/17/ZSIHQ.
- Distribution:** Uttarakhand.
11. Genus: *Multioppia* Hammer, 1961 1961. *Multioppia* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13**(1): 61.11.
- Multioppia stellifera** Hammer, 1961
1961. *Mulotioppia stellifera* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13**(1): 63.

- Material Examined:** 1 , Kihim Village, Raigad, Maharashtra, 22.ix.2013 from Soil and litter, Coll. S. Acharya, 5030/17/ZSIHQ. **Distribution:** India: West Bengal, Uttar Pradesh.
12. Genus *Oppia* Koch, 1836. *Oppia* Koch, *Deutschlands crustaceen, Myriapoden und Arachniden*, 1-9.
12. *Lasiobelba kuehnelti* (Csiszar, 1961) (= *Oppia kuehnelti* Csiszar, 1961)
1961. *Oppia kuehnelti* Csiszar, *Acta zool. Hung.*, 7: 345-366.
- Material Examined:** 1 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 4989/17/ZSIHQ.
- Distribution:** West Bengal, Assam, Kerala, Tripura, Sikkim, Manipur, Gujarat, Arunachal Pradesh, Mizoram.
10. Family: ORIBATELLIDAE Jacot, 1925
13. Genus: *Lamellobates* Hammer, 1958
1958. *Lamellobates* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, 10(1): 100.
13. *Lamellobates palustris* Hammer, 1958
1958. *Lamellobates palustris* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, 10(1): 100.
- Material Examined:** 5 Ratnagiri Fort, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter Coll. S. Acharya, 4984/17/ZSIHQ; 1 , Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 4985/17/ZSIHQ; 1 , Majiwara, Thane, Maharashtra, 16.ix.2013 from Soil and litter, Coll. S. Acharya, 4986/17/ZSIHQ; 2 , Kihim Village, Raigad, Maharashtra, 22.ix.2013 from Soil and litter, Coll. S. Acharya, 4987/17/ZSIHQ.
- Distribution:** West Bengal, Bihar, Tripura, Uttar Pradesh.
11. Family: SCHELOBATIDAE Jacot, 1935
14. Genus: *Schelorbates* Berlese, 1908
1908. *Schelorbates* Berlese, *Redia*, 5: 2.
14. *Schelorbates curvialatus* Hammer, 1961
1961. *Schelorbates curvialatus* Hammer, *Biol. Skr. Dan Vid. Selsk.*, 21(4):35.
- Material Examined:** 1 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 5015/17/ZSIHQ; 1 , Varsoli Sea Beach, Raigad, Maharashtra, 21.ix.2013 from soil and litter, Coll. S. Acharya, 5016/17/ZSIHQ; 2 , Mahakali Cave, Andheri, Mumbai, Maharashtra, 15.ix. 2013 from Soil and Litter, Coll. S. Acharya, 5017/17/ZSIHQ; 5 , Ratnagiri Fort, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 5018/17;1 , Aarey Colony, Andheri Mumbai, Maharashtra, 13.ix.2013 from Soil & litter, Coll. S Acharya; 5019/17/ZSIHQ; 3 , Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 5020/17/ZSIHQ.
- Distribution:** West Bengal, Himachal Pradesh, Uttar Pradesh.
15. *Schelorbates huancayensis* Hammer, 1961
1961. *Schelorbates huancayensis* Hammer, *Biol. Skr. Dan Vid. Selsk.*, 21(4):35.
- Material Examined:** 45 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 5022/17/ZSIHQ; 4 Varsoli Sea Beach, Raigad, Maharashtra, 21.ix.2013 from soil and litter, Coll. S. Acharya, 5023/17/ZSIHQ; 8 , Kurla drainage area, Andheri, Mumbai, Maharashtra, 14.ix.2013 from Soil and Litter, Coll. S. Acharya, 5024/17/ZSIHQ; 8 , Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and litter, 5025/17/ZSIHQ.
- Distribution:** West Bengal, Assam, Himachal Pradesh.
12. Family: HAPLOZETIDAE Grandjean, 1936
15. Genus: *Trachyoribates* Berlese, 1908
1908. *Trachyoribates* Berlese, *Redia*, 5(1): 3.
16. *Trachyoribates (Rostrozetes) ovulum* Berlese (= *Rostrozetes foveolatus* Sellnick, 1925)
1908. *Trachyoribates (Rostrozetes) ovulum* Berlese, *Redia*, 5(1): 3.
- Material Examined:** Ratnagiri Fort 21
- Ratnagiri Fort, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 5006/17/ZSIHQ; 1 , Ganapatipule Temple, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 5007/17/ZSIHQ; 1 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 5008/17/ZSIHQ; 3 , D.F.O. Office Area, Thane, Maharashtra, 19.ix.2013 from Soil and Litter, S. Acharya, 5009/17/ZSIHQ; 2 , Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and litter, 5010/17/ZSIHQ; 2 , Kihim Village, Raigad, Maharashtra, 22.ix.2013 from Soil and litter, Coll. S Acharya, 5011/17/ZSIHQ; 1 , Aarey Colony, Andheri Mumbai, Maharashtra, 13.ix.2013 from Soil and litter, Coll. S Acharya; 5012/17/ZSIHQ; 1 , Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and litter, 5013/17/ZSIHQ; 1 , Kopri Pole Area, Thane, Maharashtra, 17.ix.2013 from Soil and Litter, Coll. Dr. S. Acharya, 5014/17/ZSIHQ.
- Distribution:** West Bengal, Bihar, Tripura, Himachal Pradesh.
16. Genus: *Protoribates* Berlese
1908. *Protoribates* Berlese, *Redia*, 5:1-15.
17. *Protoribates (P.) magnus* (Aoki, 1982) (= *Xylobates magnus* Aoki, 1982)
1982. *Xylobates magnus* Aoki, *Bull. Inst. Sci. Tech. Yokohama Natn. Univ.* 8:173-188.
- Material Examined:** 4 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 4994/17/ZSIHQ ; 11 , Kurla drainage area, Andheri, Mumbai, Maharashtra, 14.ix.2013 from Soil and Litter, Coll. S. Acharya, 4995/17/ZSIHQ; 1 , Dadar Railway Colony, Mumbai, Maharashtra, 13.ix.2013 from soil and litter, Coll. S. Acharya, 4996/17;1 , Aarey Colony, Andheri Mumbai, Maharashtra,

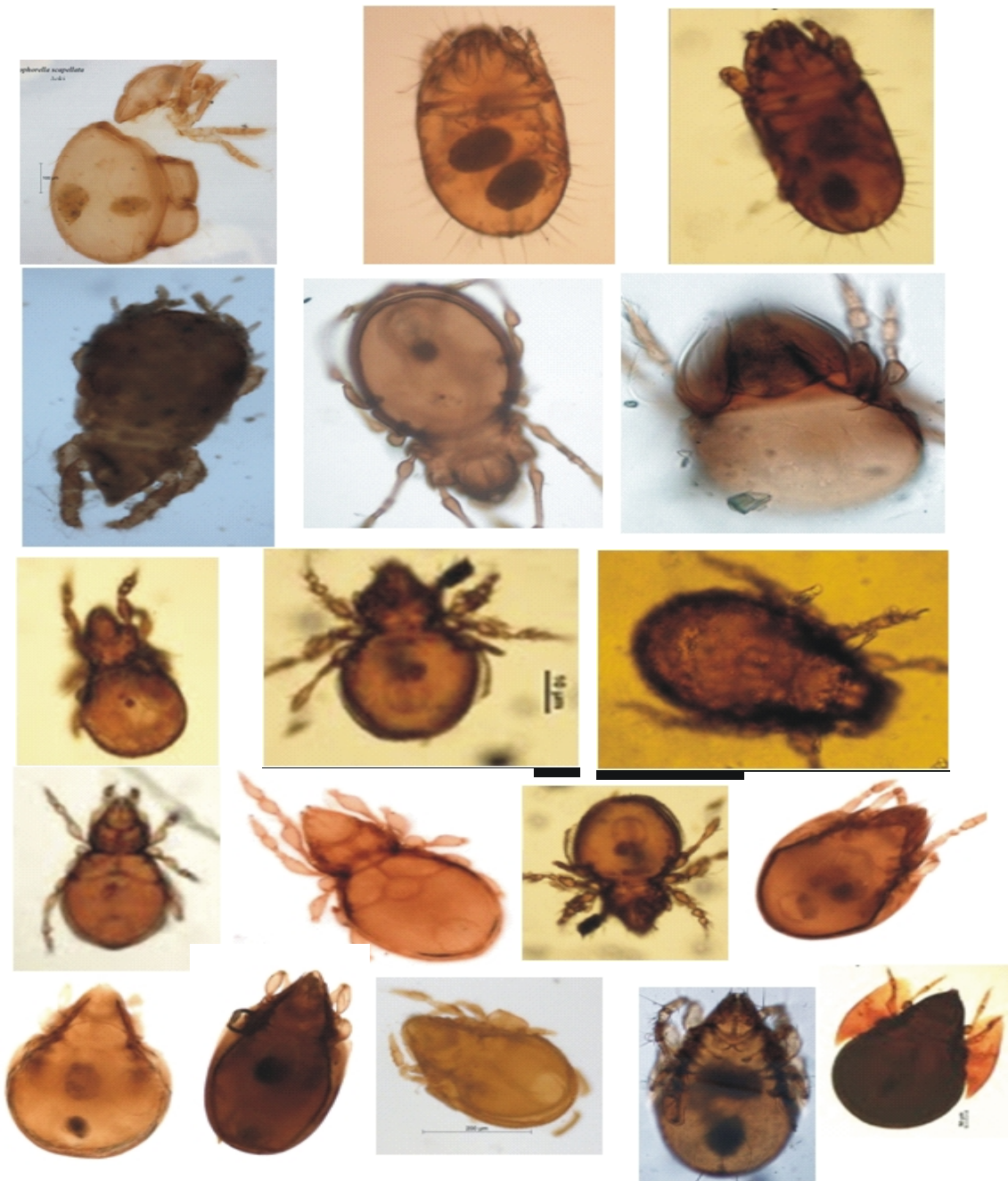


Plate. 1. *Hoplophorella scapellata* Aoki; 2. *Annectacarus* sp.; 3. *Javacarus* sp.; 4. *Allonothrus russeolus russeolus* Wallwork; 5. *Gymnodamaeus glaber* (Mihelcic); 6. *Orthozetes dispar* Balogh; 7. *Eremobelba* sp.; 8. *Basilobelba* sp.; 9. *Tectocephus velatus* (Michael); 10. *Brachioppiella periculosa* Hammer; 11. *Multioppia stellifera* Hammer; 12. *Lasiobelba kuehnelti* (Csizar); 13. *Lamellobates palustris* Hammer; 14. *Scheloribates curvialatus* Hammer; 15. *Scheloribates huancayensis* Hammer; 16. *Trachyoribates (Rostrozetes) ovulum* Berlese (= *Rostrozetes foveolatus*); 17. *Protoribates (P.) magnus* (Aoki); 18. *Galumna* sp.

13.ix.2013 from Soil and litter, Coll. S. Acharya; 4997/17/ZSIHQ; 6 Dadar Nursery Area, Mumbai, Maharashtra, 14.ix.2013 from Soil and Litter, Coll. S. Acharya, 4998/17/ZSIHQ; 4 , Mandavgaon, Raigad, Maharashtra, 22.ix.2013 from soil and litter, Coll. S. Acharya, 4999/17/ZSIHQ; 39 Varsoli Sea Beach, Raigad, Maharashtra, 21.ix.2013 from soil and litter, Coll. S. Acharya, 5000/17/ZSIHQ; 4 , Mahakali Cave, Andheri, Mumbai, Maharashtra, 15.ix.2013 from Soil and Litter, Coll. S. Acharya, 5001/17/ZSIHQ; 14 , Kihim Village, Raigad, Maharashtra, 22.ix.2013 from Soil and litter, Coll. S. Acharya, 5002/17/ZSIHQ; 1 , Brindavan Village, Thane, Maharashtra, 16.ix.2015 from Soil and litter, Coll. S. Acharya, 5003/17/ZSIHQ; 4 Varsoli Sea Beach, Raigad, Maharashtra, 21.ix.2013 from soil and litter, Coll. S. Acharya, 5004/17/ZSIHQ; 1 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil and Litter, Coll. S. Acharya, 5005/17/ZSIHQ.

Distribution: Himachal Pradesh.

13. Family: GALUMNIDAE Jacot, 1925

17. Genus *Galumna* (*Galumna*) Heyden 1826. *Galumna* (*Galumna*) Heyden, *Isis Oken*, **18**: 611.

18. *Galumna* sp.

Material Examined: 3 , Ganapatipule Temple, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll. S. Acharya, 4966/17/ZSIHQ ; 1 , Aarey Colony, Andheri Mumbai, Maharashtra, 13.ix.2013 from Soil and litter, Coll. S. Acharya; 4967/17/ZSIHQ, 7 Ratnagiri Fort, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and Litter, Coll.S. Acharya, 4968/17/ZSIHQ; 7 , Nagaon Village, Raigad, Maharashtra, 22.ix.2013 from Soil & Litter, Coll. S. Acharya, 4969/17/ZSIHQ ; 4 , Mandavgaon, Raigad, Maharashtra, 22.ix.2013 from soil & litter, Coll. S. Acharya, 4970/17/ZSIHQ; 2 , Kudal Village, Sawantwari, Sindhudurg, Maharashtra,

28.ix.2013 from Soil and litter, Coll. S. Acharya, 4971/17/ZSIHQ; 1 , Kalyan, Thane, Maharashtra, 12.ix.2013 from Soil & Litter, Coll. S. Acharya, 4972/17/ZSIHQ; 1 , Basari Village, Ratnagiri, Maharashtra, 25.ix.2013 from Soil and litter, 4973/17/ZSIHQ; 1 , Majiwara, Thane, Maharashtra, 16.ix.2013 from Soil and litter, Coll. S. Acharya, 4974/17; 1 , Mahakali Cave, Andheri, Mumbai, Maharashtra, 15.ix.2013 from Soil and Litter, Coll. S. Acharya, 4975/17/ZSIHQ; 8 , Kihim Village, Raigad, Maharashtra, 22.ix.2013 from Soil and litter, Coll. S. Acharya, 4976/17/ZSIHQ.

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