CHAPTER 5
OBSERVATION

Results of the field sampling carried out from the various the mangrove ecosystems of North Kerala disclosed the presence of 23 species belonging to 21 genera, 16 families and 10 Superfamilies (Table.4). The Superfamily Oripodoidea showed the maximum diversity, comprising members of 6 families viz. Oribatulidae, Hemileiidae, Scheloribatidae, Oripodidae, Protoribatidae and Haplozetidae. Of these, maximum genera of oribatid mites could be recovered under the family Lohmanniidae, followed by Haplozetidae and Austrachipteriidae. The superfamily wise representation of the mangrove inhabiting oribatids recovered during the present study could be presented as (Plate14; Fig.1-2):

Oripodoidea>Ameronothroidea> Cosmochthonioidea= Lohmannioidea=
Euphthiracaroidea= Phthiracaroidea=
Crotonioidea=Carabodoidea=Limnozetoidea=Galumnoidea.

Among the 23 species recovered from the various mangrove ecosystems distributed over Malappuram, Kozhilode, Kannur and Kasaragod districts of North Kerala, 6 species and 1 genus could be identified as new to science. The new genus erected during the present study was Holocarinozetes gen.nov. under the family Fortuyniidae. The 6 new species described during
the study were *Haplacarus aureus* sp.nov. (Lohmanniidae), *Selenoribates mangrovius* sp.nov. (Selenoribatidae), *Holocarinozetes epimeratus* gen.nov.sp.nov.(Fortuyniidae), *Phauloppia kadalundiensis* sp.nov. (Oribatulidae), *Protoripoda (Protoripoda) trifoliatus* sp.nov. and *Trachyoribates (Rostrozetes) nortoni* sp.nov.(Haplozetidae). The species collected under the family Lohmanniidae were *Annectacarus unilateralis* Hammer, 1973; *Heptacarus hirsutus* Wallwork, 1964; *Javacarus (Javacarus) porosus* Hammer, 1979 and *H. aureus* sp.nov. The species collected under Haplozetidae were *Indoribates (Indoribates) punctulatus* (Sellnick, 1925) and *T.(R.).ovulum ovulum* Berlese, 1908 and *T.(R.)nortoni* sp.nov. The species collected under Trhypochthoniidae were *Afronothrus arboreus* Ramani and Haq, 1992 and *Archegozetes longisetosus* Aoki, 1965. The family Austrachipteriidae was represented by *Lamellobates (Lamellobates) molecula* Berlese, 1947 and *L.(Paralamellobates) bengalensis* Bhaduri and Raychaudhuri, 1968. The families Cosmochthoniidae, Euphthiracaridae, Phthiracaridae, Carabodiade, Selenoribatidae, Fortuyniidae, Oribatulidae, Hemileiidae, Scheloribatidae, Oripodidae, Protoribatidae and Galumnidae were represented by a single species each (Table.4).

Apart from the detection and description of a new genus and 6 new species, the results of the study also helped to distinguish 14 species belonging to 13 genera and 10 families as new records from the mangrove ecosystems. The newly recorded mangrove inhabiting species were *A.*
unilateralis, H. hirsutus, J. (J.) porosus, A. clavata, Hoplophorella (Hoplophorella)vitrina, A. arboreus, A. longisetosus, Carabodes (Klapperiches) penicillus, L. (P.) bengalensis, Siculobata (Siculobata) malabarica, Protoribates (Protoribates) capucinus, I. (I.) punctulatus and Galumna (Galumna) paragibbula.

The distribution pattern of the oribatid species collected showed variation with respect to the differences in the site characteristics like the vegetational, geographical and climatic features. The mangrove ecosystems located in the Malappuram Dt. disclosed the presence of 5 species belonging to 4 genera, 4 families and 3 superfamilies (site1) and 4 species belonging to 4 genera, 4 families and 3 superfamilies (site 2). Families like Austrachipteriidae and Haplozetidae showed the maximum generic representation, comprising members of 2 genera each. Members of 1 genera could be recovered under Lohmanniidae from the collection sites of Malappuram Dt. and the remaining families viz. Phthiracaridae, Scheloribatidae and Protoribatidae were represented by one genus each. The generic diversity of the various oribatid families recovered from the sites of Malappuram Dt. could be presented as follows:

Austrachipteriidae=Haplozetidae>Lohmanniidae=Phthiracaridae

=Scheloribatidae-Protoribatidae
In Kozhikode Dt, the sites 1 and 2 disclosed the presence total of 14 species, representing 14 genera, 13 families and 10 superfamilies. The species diversity of oribatids in the mangrove ecosystems in the Kozhikode Dt. (Sites 3-7) was comparatively high. The selected mangrove sites in this district showed unique vegetational and geographical characteristics. As shown in table 6, a total of 19 species belonging to 17 genera, 13 families and 10 superfamilies could be recovered from the all the sites together, from this district. Sites 3 and 4 supported both true and associate mangrove vegetation, from which 14 species belonging to 14 genera, 13 families and 11 superfamilies could be collected. These sites were found to harbor several new taxa of oribatids such as *Holocarinozetes* gen.nov., *H. epimeratus* gen.nov. sp.nov. (Fortuyniidae), *P. kadalundiensis* sp.nov. (Oribatulidae) and *P. (P.) trifoliatu*s sp.nov. Sites 5-7 were represented by small mangrove patches, which on screening enabled to collect a total of 8 species under 7 genera, 4 families and 3 superfamilies, including 2 new species viz. *H. aureus* sp.nov. (Lohmanniidae) and *T. (R.) nortoni* sp.nov.

Based on the generic diversity of the oribatid mites, the mangrove dwelling oribatid families of the various sites in the Kozhikode Dt. could be represented as follows:

Lohmanniidae>Austrachipteriidae=

Haplozetidae>Cosmochthoniidae=Euphthiracaridae=

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Phthiracaridae=Trhypochthoniidae=Carabodidae=Fortuyniidae=Oribatulidae=Hemileiidae=Scheloribatidae=Oripodidae=Protoribatidae=Galumnidae

The family Lohmanniidae included the maximum genera (4 genera) comprising species viz. *H. hirsutus*, *A. unilateralis*, *H. aureus* sp.nov. and *J. (J.)porosus*. The families Austrachipteriidae and Haplozetidae were represented by 2 genera each, and families like, Cosmochthoniidae, Euphthiracaridae, Phthiracaridae, Trhypochthoniidae, Carabodidae, Oribatulidae, Hemileiidae, Scheloribatidae and Protoribatidae were represented by a single genus each.

The results sampling carried out from the various mangrove ecosystems of Kannur Dt. (sites 8-14) brought out the presence of 15 species grouped under 14 genera, 11 families and 9 superfamilies. A truly intertidal new species viz. *S. mangrovius* sp.nov. (Selenoribatidae) also could be recorded from site 13 of this Dt. The various oribatid families could be arranged in the following sequence, based on the number of genera included under each.

Lohmanniidae>Austrachipteriidae=Haplozetidae>Euphthiracaridae=Phthiracaridae=Trhypochthoniidae=Carabodidae=Selenoribatidae=Scheloribatidae=Protoribatidae=Galumnidae.

Of these, the family Lohmanniidae was found represented by 3 genera, while Austrachipteriidae and Haplozetidae included 2 genera each and the families Euphthiracaridae, Phthiracaridae, Trhypochthoniidae, Carabodidae,
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Selenoribatidae, Scheloribatidae, Protoribatidae and Galumnidae were found to comprise a single genus each.

The single site screened from the Kasaragod Dt. (Site-15) revealed the presence of 5 species belonging to 5 genera, 5 families and 4 superfamilies and according to the variations in the generic diversity, the above families could be arranged in the following order.

\[
\text{Cosmochthoniidae} = \text{Euphthiracaridae} = \text{Trhypochtoniidae} = \text{Austrachipteriidae} = \text{Haplozetidae}
\]

The species diversity of the mangrove dwelling oribatids included in the 15 sites could be presented as

\[
\text{Site 3} = \text{Site 4} > \text{Site 13} > \text{Site 1} = \text{Site 8} = \text{Site 15} > \text{Site 2} > \text{Site 5} = \text{Site 6} = \text{Site 12} = \text{Site 14} > \text{Site 7} = \text{Site 10} > \text{Site 11} \text{ (Table. 5; Plate, 14, Fig.3)}
\]

During sampling, both the adult and immature stages of various oribatid species were recovered from dead leaves of true and mangrove associates, and from their litter including twigs, barks, dead pneumatophores, and also from algal cushions attached to pneumatophores and other mangrove litter substrates. In the present study, members of some truly intertidal oribatid families like Fortuyniidae and Selenoribatidae could be recorded for the first time from the mangrove ecosystems of oriental region, especially from the Indian subcontinent.