

Genetic Diversity of Termite (Isoptera) Fauna of Western Ghats of India

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Abstract : Termites are very vital ecological thespians in tropical ecosystem, having been designated as “ecosystem engineers”, due to their significant role in providing soil ecosystem services. Despite their importance, our understanding of a number of their basic biological processes in termites is extremely limited. Developing a better understanding of termite biology is closely dependent upon consistent species identification. At present, identification of termites is relied on soldier castes. But for many species, soldier caste is not reported, that creates confusion in identification. The use of molecular markers may be helpful in estimating phylogenetic relatedness between the termite species and estimating genetic differentiation among local populations within each species. To understand this, termites samples were collected from various places of Western Ghats covering four states namely Karnataka, Kerala, Tamil Nadu, Maharashtra during 2013-15. Termite samples were identified based on their morphological characteristics, molecular characteristics, or both. Survey on the termite fauna in Karnataka, Kerala, Maharashtra and Tamil Nadu indicated the presence of a 16 species belongs to 4 subfamilies under two families viz., Rhinotermitidae and Termitidae. Termitidae was the dominant family which was belonging to 4 genera and four subfamilies viz., Macrotermitinae, Amitermitinae, Nasutitermitinae and Termitinae. Amitermitinae had three species namely, *Microcerotermes fletcheri*, *M. pakistanicus* and *Speculitermes sinhalensis*. Macrotermitinae had the highest number of species belonging two genera, namely *Microtermes* and *Odontotermes*. *Microtermes* genus was with only one species i.e., *Microtermes obesi*. The genus *Odontotermes* was represented by the highest number of species (07), namely, *O. obesus* was the dominant (41 per cent) and the most widely distributed species in Karnataka, Karala, Maharashtra and Tamil nadu followed by *O. feae* (19 per cent), *O. assmuthi* (11 per cent) and others like *O. bellahunisensis* *O. horni* *O. redemanni*, *O. yadevi*. Nasutitermitinae was represented by two genera namely *Nasutitermes anamalaiensis* and *Trinervitermes biformis*. Termitinae subfamily was represented by *Labiocapritermes distortus*. Rhinotermitidae was represented by single subfamily Heterotermetinae. In Heterotermetinae, two species namely *Heterotermes balwanthi* and *H. malabaricus* were recorded. Genetic relationship among termites collected from various locations of Western Ghats of India was characterized based on mitochondrial DNA sequences (12S, 16S, and COII). Sequence analysis and divergence among the species was assessed. These results suggest that the use of both molecular and morphological approaches is crucial in ensuring accurate species identification. Efforts were made to understand their evolution and to address the ambiguities in morphological taxonomy. The implication of the study in revising the taxonomy of Indian termites, their characterization and molecular comparisons between the sequences are discussed.

Keywords : isoptera, mitochondrial DNA sequences, rhinotermitidae, termitidae, Western ghats

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