SUMMARY

The collision of the Indian subcontinent with mainland Asia profoundly shaped regional biodiversity, driving significant divergence and dispersal events that influenced the biota of the region. In this context, the army ant genus *Aenictus*, with its widespread distribution across the Old World tropics, serves as a compelling model for understanding diversification patterns. This genus is characterized by a unique set of ecological and behavioral traits known as the "army ant syndrome," which includes nomadic behavior, mass foraging strategies, and the presence of a permanently wingless queen. These adaptations not only define their ecological role within tropical ecosystems but also impose specific constraints and opportunities for their dispersal and diversification.

Our study examined the phylogenetic relationships and biogeographic history of *Aenictus*, focusing on testing the monophyly of species groups, understanding dispersal mechanisms, and identifying drivers of diversification. Using a comprehensive phylogenetic framework built on four genetic markers, we found that many traditionally defined species groups are non-monophyletic. This lack of monophyly suggests that reliance on labile morphological traits, which rapidly evolve in response to environmental pressures, has likely obscured deeper evolutionary relationships. Ancestral area reconstruction indicates a Southeast Asian origin for *Aenictus*, which subsequently acted as a source for multiple dispersal events into the Indian subcontinent, Africa, and Australia. Despite the winglessness of queens, which limits dispersal capabilities, geo-dispersal via land bridges and potential rafting events may have facilitated long-range movements. The Indian subcontinent, in particular, served as a crucial "sink" region, receiving repeated colonization events. Diversification patterns revealed through a lineage-through-time analysis highlight a significant increase during the late Miocene (~8

million years ago). This period was marked by climatic shifts, including aridification and forest fragmentation, which likely promoted allopatric speciation by isolating forest-dwelling populations. These environmental changes, coupled with the genus's preference for forest habitats, shaped its current diversity and distribution. Our integrative approach, combining molecular data with morphological assessments, resolved taxonomic ambiguities and led to the discovery of five new species and two new records from the Indian subcontinent. These findings underscore the genus's significant radiation and endemism in biodiversity hotspots like the Western and Eastern Ghats.

In conclusion, our study provides a comprehensive insight into the phylogeny, biogeography, and diversification of the army ant genus *Aenictus*. We underscore the significance of historical climatic events, such as aridification and forest fragmentation, as well as geographic connectivity, including land bridges and dispersal routes, in shaping the evolutionary trajectory of this genus. The findings highlight the Indian subcontinent's pivotal role as a dispersal bridge and source of local endemism, while also showcasing Southeast Asia as the primary center of origin. However, gaps in sampling, particularly in Africa and the Afro-Arabian regions, limit our understanding of the genus's full biogeographic history. Future research focused on these underrepresented areas, combined with advanced genomic approaches, will further refine the evolutionary and biogeographic narrative of *Aenictus* and enhance our understanding of ant diversity and dispersal mechanisms in tropical ecosystems.