
Summary

Dorylus army ants are considered to be keystone predator species in many afrotropical ecosystems. Yet our knowledge of the evolutionary and behavioural ecology of this fascinating group is still very sparse. Members of the subgenera *Alaopone*, *Dichtadia*, *Dorylus* s.str., *Rhogmus* and *Typhlopone* hunt and nest in the soil (hypogaeic life-style), while some *Anomma* species hunt in the leaf-litter (members of the *gerstäckeri* group, intermediate life-style) and the others conduct massive swarm raids on the surface and up into the vegetation (the fierce and famous driver ants, epigaeic life-style). According to an evolutionary scenario the hypogaeic life-style is the ancestral state in this group. To identify possible selection pressures driving the evolution of worker morphology in this genus, I have analysed the allometries of functionally important body traits in relation to life-style. There is a clear-cut trend of increasing relative size of eight out of nine studied characters from hypogaeic to intermediate to epigaeic species. The results strongly suggest that the ecological niche shifts necessitated adaptations in these traits. The degree of overall differentiation among species is more pronounced in larger than in smaller workers. The pattern of division of labour in the epigaeic *D. molestus* indicates that two factors that may have caused this phenomenon are new food habits and an increased need for colony defence of intermediate and epigaeic species respectively. In an attempt to clarify the functional value of long front and long hind legs which are among the traits that are very likely to represent adaptations to epigaeic foraging I analysed the food spectrum and food transport by the two epigaeic species *D. molestus* and *D. wilverthi*. I show that even within the category of epigaeic species front and hind legs correlate with foraging stratum use. While *D. molestus* searches in the vegetation, on the surface and intensely in the leaf-litter and top soil layers, the longer-legged *D. wilverthi* appears to restrict its hunting efforts to the vegetation and surface. *D. wilverthi* workers do not carry relatively larger food items and so it is concluded that other factors such as energy efficiency in locomotion or climbing ability may have selected for longer legs in this species. The migration behaviour of the army ant *Dorylus molestus* was studied in the montane forest of Mt Kenya. I found that stay duration in a nest is highly variable so that brood cycle as an underlying endogenous pattern generator can be ruled out. Local food depletion is likely to be the ultimate cause for migrations in this species, because migration distance is larger than foraging range and colonies move away from their nearest neighbours. A small percentage of migrations is triggered by pangolin attacks of nests. Despite fierce intraspecific competition colonies do not fight other colonies contrary to the prediction of a recently developed mathematical model for epigaeic swarm raiding *Dorylus* species.