

Abstract

Gregarious nymphs of *Schistocerca gregaria* and *Locusta migratoria migratorioides* are often seen to march together in common bands in the field. In the present study, the intraspecific aggregation responses of nymphal and older stages of the two insects were compared with their interspecific responses. Unlike *S. gregaria*, *L. m. migratorioides* shows a lesser pattern of stage and sex differentiation in its aggregation pheromone biology. Thus, although fifth-instar nymphs did not respond significantly to the adult pheromone, adults responded significantly to the nymph pheromone. No cross-stage aggregative responses occur in *S. gregaria*. In the adults of *S. gregaria*, production of the pheromone is male-specific; in *L. m. migratorioides* both sexes induced a significant level of aggregation from conspecifics. Aggregation assays between corresponding stages of the two species showed stronger interaction between the nymphal stages than between the adults and account for the frequent occurrence of mixed hopper bands in the field. GC-EAD studies of volatiles of nymphal and adult stages by using antennal preparations from both species also showed significant interspecies reactivities. GC-MS analyses showed that of *S. gregaria* nymphal pheromone components (C6 and C8 to C10 straight-chained aldehydes and acids and the fecal phenols, guaiacol and phenol), the acids and phenols constitute the common components of nymphal stages. Phenylacetonitrile, the major component of *S. gregaria* adult aggregation pheromone, is present in *L. m. migratorioides* nymphal volatiles, albeit at a lower level. Unlike *S. gregaria* adult pheromone blend, which is made up wholly of benzene derivatives, the volatile emissions of *L. m. migratorioides* adults is dominated by aliphatic aldehydes and alcohols. The possible role of cross-aggregation effects in mutually facilitating phase transformation of the two species is discussed.