

Abstract

We have studied on-host behaviour of adults of the brown ear tick (*Rhipicephalus appendiculatus* Neumann, 1901) and the red-legged tick (*R. evertsi* Neumann, 1897), which prefer to feed mainly inside the ears and the anal regions of bovids respectively. Both species were found to be relatively successful in orienting toward and locating their respective feeding sites from different parts of the host body. Our observations suggested the operation of both avoidance (closer to the feeding site of the other) and attraction (closer to its own feeding site) responses of the ticks. In the laboratory, odour trapped from cattle ears attracted *R. appendiculatus* but repelled *R. evertsi*, whereas that from the anal region had an opposite effect. This odour-based 'push-pull' pair of stimuli may largely account for efficient orientation behaviour of the two tick species to their respective feeding sites. We propose that such concurrent deployment of repulsive and attractive cues may be quite widespread among arthropods and related organisms that specialise on specific hosts or microenvironments in the performance of their biological functions.