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DEVELOPMENT OF A BIOLOGICAL TICK TRAP BASED ON ATTRACT-AND-KILL STRATEGY

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Abstract The most frequently reported vector-borne diseases in the temperate zone of the Northern Hemisphere are related to ticks, e.g. borreliosis and tick-borne encephalitis. In Europe, *Ixodes ricinus* (Acari: Ixodidae) is the most abundant species infesting a wide range of hosts. Increased public awareness concerning infectious ticks has raised interest in an effective tick control. The aim of this project is the development of a tick trap based on an attract-and-kill strategy. Therefore, we screen long and short range attractants as well as aggregation pheromones. For the first time we demonstrate behavioural assays with *I. ricinus* nymphs using a novel y-olfactometer for screening compounds of, inter alia, the classes of aldehydes, lactones, and terpenoids. We demonstrate a significantly attractive effect of CO_2 on *I. ricinus*. Further we screen aggregation pheromones using a refined static assay. Up to date we detected aggregation pheromones of the classes of purines and their derivatives. These substances combined (attractant component) will be released through a capsule-based biopolymer system, which is coupled with a kill component, a naturally occurring entomopathogenic fungus. The fungus *Metarhizium* spp. is able to infect the ticks as they come into contact with the capsules. The intention of the trap is to provide protection against *I. ricinus* in areas frequently used by humans. Future research should investigate whether similar results are obtained when adult *Ixodes* ticks or other tick species are tested.