

Community dynamics of rodents, fleas and plague associated with black-tailed prairie dogs

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ABSTRACT

Black-tailed prairie dogs (*Cynomys ludovicianus*) are epizootic hosts for plague (*Yersinia pestis*); however, alternate enzootic hosts are important for the maintenance of the pathogen. We determined small rodent and prairie dog associations and quantified rodent and flea relationships in the presence and absence of prairie dog colonies and plague. We identified potential alternate hosts and flea vectors for the maintenance and transmission of plague in the prairie ecosystem. This is the first multi-year study to investigate associations between prairie dogs, rodents and fleas across the range of the black-tailed prairie dog. Few rodent species associated with black-tailed prairie dogs and were found to be highly abundant on colonies. Rodent species implicated in plague were present at study areas with and without plague. *Peromyscus maniculatus* and *Onychomys leucogaster*, two widely occurring species, were more abundant in areas with a recent history of plague. Flea community characteristics varied within each study area in the presence and absence of prairie dogs. Based on flea diversity on rodents, and the role of rodents and fleas in plague, we identified *P. maniculatus* and *O. leucogaster* and their associated fleas, *Aetheca wagneri*, *Malareus telchinus*, *Orchopeas leucopus*, *Peromyscopsylla hesperomys*, and *Pleochaetis exilis* to be important for the dynamics of sylvatic plague in our study areas. *Peromyscus maniculatus* and *O. leucogaster* were consistently infected with *Bartonella* spp., another blood parasite. Presence of prairie dog fleas on other rodents at both off and on prairie dog colonies suggests the potential for intra and interspecific transmission of fleas between rodent hosts, and between other small rodents and prairie dogs.