

Ecological and Epidemiological Studies on Mediterranean Spotted Fever in the Negev Desert of Israel

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In order to examine the epidemiology of Spotted Fever Group Rickettsiae (SFGR) and the ecology of their tick vectors in Israel, two settlements in the northern Negev were chosen. In one community (Ze'elim), a relatively high rate of morbidity to SFGR had been observed and was chosen as the study site. A matched control site with no detected morbidity was selected at Kibbutz Re'im (Sarov et al. 1990). The species, seasonality, hosts and biotopes of the ticks were studied during monthly visits in each settlement for 11 months starting from April 1989. Free-living ticks were caught by flagging and CO₂-trapping. Both methods revealed that in the study area ticks were prevalent during the whole year but specially abundant from April to October. In the control site ticks were found mainly from April to July. They were seldom seen during August and September and absent from November to January. Free-living ticks inside the settlements were found around the dog kennels, on grass surrounding the living quarters and around the hay stacks. Outside the settlements ticks were seen along the rows of trees, on grass 10-20 cm high or on the ground hiding under small stones, pieces of wood or other small objects. Approximately 9 times more ticks were collected in the study site than in the control site. *Rhipicephalus sanguineus sensu stricto* was the dominant species in the study site, whereas in the control site *R. sanguineus sensu stricto* and *R. turanicus* were equally prevalent. All developmental stages of the ticks were abundant inside and outside the study settlement, compared with the control area where larval and nymphal stages of the ticks were practically absent inside, and very rare outside the settlement. In the study area 50-80% of the dogs were infested with ticks during the whole year whereas in the control area approximately 50% of the dogs were infested from April to July and the percentage then fell gradually. From October to January no ticks could be detected. Most of the dogs were infested with 1-10 adult ticks which were found mainly on the ears, head, neck and between the toes. Dogs heavily infested with all active stages of the ticks were found only in the study settlement. Wild cats living inside the settlements were infested with small numbers of adult ticks. Hedgehogs were found only in the study area and all of them were heavily infested with all stages of the ticks. Other wild animals

caught inside and outside the settlements which were infested with ticks included: *Mus musculus* (9.4%), *Rattus rattus* (7.7%), *Meriones crassus* (42.4%) and *Crocidura russula* (12.5%). In the study area animals were mainly infested with *R. sanguineus* *sen. str.* In the control site *R. sanguineus* *sen. str.* and *R. turanicus* were equally present. Using the hemolymph test (Burgdorfer, 1970) it was found that 3.6% (N = 137) of the parasitic ticks and 6.8% (N = 722) of the free-living ticks were positive for SFGR. Antibodies to SFGR were detected in sera of the following animals: dogs (97%), cats (13.3%), *M. musculus* (4.7%) and *R. rattus* (44.5%).

It appears that people in the study area have more frequent contact with ticks and their chances to acquire MSF is also much higher than those in the control area.

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