

Analysis of social networks in rodents under different environmental conditions

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During the last decade social network analysis has increased in importance as a methodological framework to study inter- and intra-specific relations between animals. Understanding patterns in social network structure have important consequences in biological control, conservation and help us make inferences about parasite/pathogen transmission dynamics in animal systems. Rodents are reservoirs and vectors of several important diseases in Europe and are sensitive to environmental change. As such, we use rodents as model organisms to study the effects of altitude (proxy for global climate change) and habitat disturbance on structure of social networks.

Capture-mark-recapture (CMR) sampling was carried out using 16 replicated grids in an 8x8 live-trap array set in both disturbed and undisturbed forests (in terms of recent or former tree cutting) in low (ca. 650 m a.s.l.) and high altitude (ca. 1250 m a.s.l.) in the Italian Dolomites. During 14,336 trap-nights separated to seven two-night sessions every month (April – October 2012), a total of 1,280 rodent individuals were captured, belonging to four species: *Apodemus flavicollis*, *A. sylvaticus*, *Myodes glareolus* and *Microtus multiplex*. Rodent communities of high-altitude forests were significantly richer and more abundant having two main species (*A. flavicollis* and *M. glareolus*) in contrast to communities of low-altitude ones highly predominated by *A. flavicollis*.

In this contribution, we describe the practicalities of constructing contact networks of rodents based on space sharing as revealed from CMR sampling. We present the social network structure of wild rodents under different environmental conditions, both visually and statistically.