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## Habitat characteristics and species interference influence space use and nest-site occupancy: implications for social variation in two sister species

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5 **Habitat characteristics and species interference influence space use and nest-site occupancy:**  
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26 **Abstract**

27 Nest-site selection is an important component of species socio-ecology, being a crucial factor in  
28 establishment of group living. Consequently, nest-site characteristics together with space-use proxies may  
29 reveal the social organization of species, which is critical when direct observation of social interactions is  
30 hindered in nature. Importantly, nest-site choice is expected to be under strong selective pressures and the  
31 object of intra- and inter-specific competition. Although the bulk of research on sociality focuses on its  
32 ecological drivers, our study introduces interspecific competition as a potential factor that could influence  
33 social evolution. We investigated the influence of habitat and interspecific competition on the social  
34 organization of two sister species of the African four striped mouse (*Rhabdomys dilectus dilectus* and  
35 *Rhabdomys bechuanae*) in a similar macroenvironment. These species diverged in allopatry and occupy  
36 distinct environmental niches. We radiotracked 140 adults to identify their nest-sites, determine nest  
37 characteristics and record groups that shared nest-sites. Group cohesion was estimated from nest-site  
38 fidelity, group association strength, and home range overlap within versus between group members. We  
39 compared the two species in sympatry versus parapatry to determine the impact of species interference on  
40 sociality. In parapatry, the two species selected distinct nest-site types, interpreted as different anti-  
41 predator strategies: *R. bechuanae* selected fewer, spaced, less concealed nest-sites whereas *R. d. dilectus*  
42 selected clumped and less visible nest-sites. *Rhabdomys bechuanae* also showed more cohesive and stable  
43 social groups than *R. d. dilectus*. In sympatry, compared to *R. bechuanae*, *R. d. dilectus* occupied similar  
44 nest-sites, however slightly more exposed and clumped, and displayed similar nest-site fidelity and group  
45 association strength. We conclude that although habitat selection may be an important driver of social  
46 divergence in *Rhabdomys*, species interference, by limiting *R. d. dilectus* movements and forcing nest-site  
47 sharing may induce new ecological pressures that could influence its social evolution.

48 Key words: habitat selection, home range overlap, interspecific competition, nest-site sharing,  
49 radiotracking, *Rhabdomys*, secondary contact, social groups

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