

House mouse subspecies do differ in their social structure

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Abstract

It is widely acknowledged that population structure can have a substantial impact on evolutionary trajectories. In social animals, this structure is strongly influenced by relationships among the population members, so studies of differences in social structure between diverging populations or nascent species are of prime interest. Ideal models for such a study are two house mouse subspecies, *Mus musculus musculus* and *M. m. domesticus*, meeting in Europe along a secondary contact zone. Though the latter subspecies has usually been supposed to form tighter and more isolated social units than the former, the evidence is still inconclusive. Here, we carried out a series of radio-frequency identification experiments in semi-natural enclosures to gather large longitudinal datasets on individual mouse movements. The data were summarised in the form of uni- and multi-layer social networks. Within them, we could delimit and describe the social units ('modules'). While the number of estimated units was similar in both subspecies, *domesticus* revealed a more 'modular' structure. This subspecies also showed more intramodular social interactions, higher spatial module separation, higher intramodular persistence of parent-offspring contacts, and lower multiple paternity, suggesting more effective control of dominant males over reproduction. We also demonstrate that long-lasting modules can be identified with basic reproductive units or demes. We thus provide the first robust evidence that the two subspecies differ in their social structure and dynamics of the structure formation.

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