
Population Dynamics – Session 1

Population cycles in a hibernating rodent

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The common hamster (*Cricetus cricetus*) in Europe has become of high conservation concern since the 1960s when the western European populations began to decline. As a result, its distribution range was substantially reduced and become highly fragmented. Yet long-term studies of its demography are lacking so the pattern of its population dynamics is poorly understood. Hamsters are known to be among highly prolific rodents which can outbreak in some years. Unlike small annual voles, hamsters are much bigger (200–600 g) and biannual. Most individuals mature following the first hibernation when they are about one year of age. Adults can produce one to three litters of 4–6 offspring each. They rarely survive to breed following the second hibernation. We analyse the 16-year data on population density of hamsters in a natural population situated on the periphery of Olomouc, Czech Republic, collected from 2002 to 2017 using a capture-recapture approach. Besides the declining temporal trend, we observed large fluctuations around the trend indicating the presence of some periodicity in data. By applying autocorrelation function, we obtained weak evidence of 4-yr population cycles. However, partial autocorrelation function and autoregressive linear models confirmed that the dynamics is of order 2, suggesting that the hamsters do exhibit cyclic dynamics resulting from the delayed density-dependence in population growth rates. We also observed important characteristics proposed to define cyclic fluctuations biologically, such as the Chitty effect, summer decline or density-dependent productivity. We are confident that studying population dynamics in other rodents than voles may bring new perspective to population cycle research.

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6th International Conference of Rodent
Biology and Management
and
16th Rodens et Spatium

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