# LIFE HISTORY STRATEGIES OF THE MONTANE VOLE, MICROTUS MONTANUS

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## Objectives

Emphasis in microtine rodent biology has historically been placed on population regulation and the population cycle. Until recently, little attention has been directed to behavior and sociality in microtine rodents, but work on the sociobiology of the montane vole (Jannett, 1978, 1980, 1981, 1982, 1984) is serving to integrate various aspects of the biology of this species so that its life history characteristics can be interpreted in an evolutionary framework. Work undertaken in 1986 continues previously initiated surveys of various topics, such as synchrony of population events in different populations, survivorship, scent gland development, patterns of cranial and dental variation, population trends in a sympatric species of vole (M. longicaudus), and reproduction in a primary predator, the shorttail weasel (Mustela erminea).

## Methods

It was unfortunately not possible to sample populations of Microtus montanus in May as had been intended. In October, traps were set for this species at 16 sites. Each effort replicated a previous trapping regime. Thirteen sample lines and three gridded areas were done. Most samples were run for only 2 days so that impact on the respective populations would be minimized. Eyes were removed for age determination upon lens weight (Gourley and Jannett, 1975). As in previous years, a trap line for shorttail weasels was set over a very wide area and three populations of Microtus longicaudus were sampled in October.

## Results

Microtus montanus: In general, populations of this species had declined dramatically since October, 1985. At three sites, no voles were taken at all. At each of four sites, only one or two voles were secured.

The decline was most obvious in open fields which usually support relatively large numbers of voles. However, 6 of the 16 sites are what may be dispersal sinks for this species, and populations at four of these sites "persisted" at their typically low densities.

One or more females, each of which was pregnant and/or lactating, were found

in each of seven sites. Each of nine sites yielded no adult female.

One or more males with scrotal testes were found at each of only 10 sites. Five of these sites yielded no adult female. There was no obvious correlation between the percentage of females still lactating and/or pregnant and the operational sex ratio, as had been found in 1983 and 1984. Figure 1 merely depicts the relation between percentage of parous females still reproductively active and the percentage of adult males among all adults, regardless of the condition of testes. (Most adult males had testes which were at least partially descended.)

Material for studies of age structure and morphometric patterns has not yet been processed.

Microtus longicaudus: Numbers of voles at three sites remained similar to those in previous years despite declines in the number of M. montanus.

Mustela erminea: No ermine of either sex was secured.

## Conclusions

Krebs and Myers (1974) concluded that there is a general pattern in microtine demography in which breeding ceases earlier in years of very high density. Making short-term samples of M. montanus in proximate populations within a few weeks in October, 1984 demonstrated that variability in the length of the "breeding season" can occur in the same year at high densities and that it is correlated with the operational sex ratio. In 1986, sampling a number of populations showed the "breeding season" to be of variable duration even at low densities. The lack of correlation at the lower densities between indicators of the operational sex ratio and continued breeding could be due to decreased contact between reproductively active adults (Jannett, 1984a).

The attempt at sampling vole populations at more sites than has heretofore been done in one year not only reinforced the pattern of variable duration of the breeding season. The persistence of voles at low densities at 4 of 6 sites chosen as non-optimal habitat indicates that "populations" are not necessarily synchronized, and that, in an area where habitat heterogeneity for the species is generally overlooked, different voles may seek different holes.

## Literature Cited

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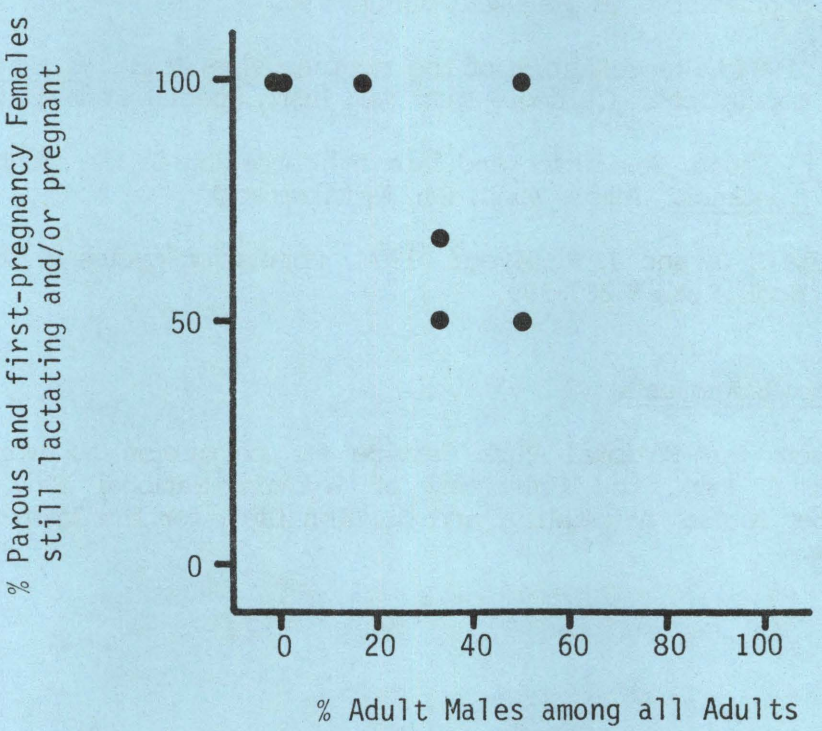


Figure 1. Percentages of adult males among all adults versus percentages of adult females reproductively active in October, based on initial gross examinations of specimens. (n = 22 adult females)

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