

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 1984 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

*Microtus montanus* were trapped in five populations in late May. In addition to the four sites sampled near Moran which had been sampled in spring, 1984, a fifth population in the southern end of the valley on the National Elk Refuge was trapped. Inasmuch as snow melt-off there is considerably earlier than at Moran, it is expected that morphometric patterns there may be very different than at Moran (Jannett, in prep.). In October, seven sample lines and two gridded areas were done, each of which replicated samples made in 1971-77, 1982-84. Additionally, one transect line, two gridded areas, and three isolated grassy patches were trapped; some of these were at sites sampled occasionally in previous years (1971-1977); others were new sites. Most samples were run for only two 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. A small series (n=8) of live *M. longicaudus* was obtained for a collaborative project with researchers at the Institute of Zoology, Academy of Sciences, Leningrad.

Results

*Microtus montanus*: Population levels of this species in May and October were lower than in the respective months in 1984. Voles were particularly scarce at

the Elk Refuge site where only nine were obtained.

In October, although there were generally fewer voles than there had been in 1984, the various sites differed in density. As in all previous years, the main study grid had the most voles. Small isolated grassy areas generally had few voles.

One or more females, each of which was pregnant and/or lactating, were found in each of five sites. Each of nine sites yielded one or more parous (adult) females no longer reproductively active. One site yielded no adult female.

One or more males with scrotal testes were found at each of only three sites. Inasmuch as one of these sites yielded no adult female, no correlation between the percentage of females still lactating and/or pregnant and the operational sex ratio could be found, as had been 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.

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

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: Two males were caught incidental to vole trapping and one was taken in the sample line. No female was obtained in 1985.

### 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, 1983 and again 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. Again, in 1985, sampling a number of populations showed the "breeding season" to be of variable duration. 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).

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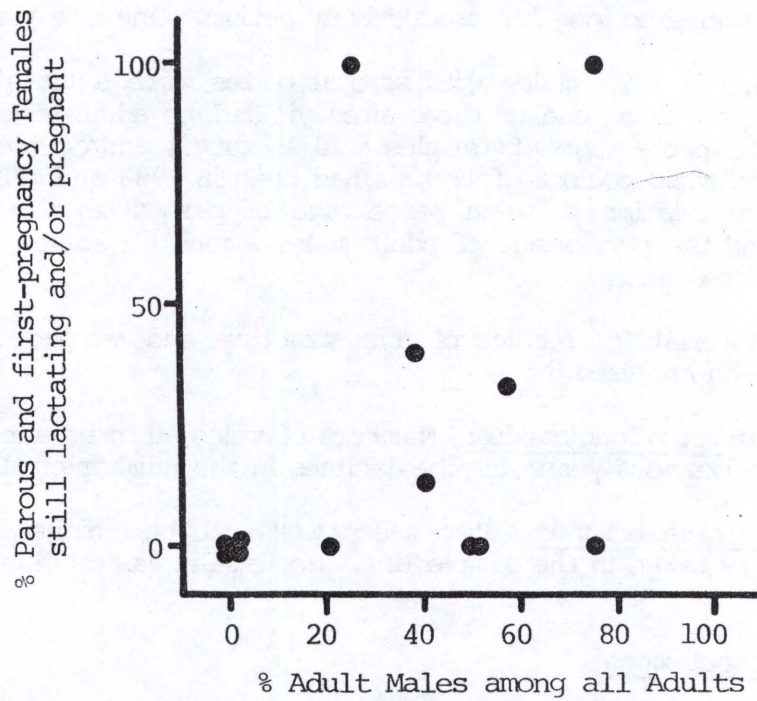


Figure 1. Percentages of adult males among all adults versus percentages of adult females reproductively active in October, based on initial gross examinations of specimens. (n = 56 adult females)

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