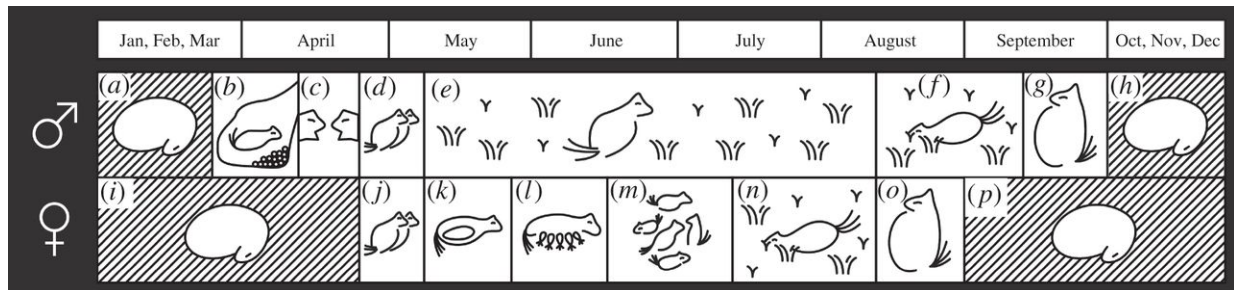


# Alaskan squirrel study shows females do far more work than males

October 6 2016, by Bob Yirka



Male and female arctic ground squirrels differ in their timing of seasonally recurring life cycle events. Males (a) terminate heterothermy earlier than females, and (b) spend an average of 15–25 days below ground undergoing gonadal growth and spermatogenesis while they consume a food cache. Following emergence, (c) males establish territories and exhibit agonist interactions with other males as they compete to (d) mate with females. Following the mating season, (e) males undergo testicular regression and have several months during which they do not exhibit agonistic interactions before they (f,g) fatten in preparation for (h) resuming hibernation; a second interval of male–male aggression occurs in late summer/autumn. In contrast, females (i) hibernate longer but (j) mate within a few days of emergence; (k) gestation lasts approximately 25 days and (l) lactation lasts approximately 28 days. Females, but not males, (m) exhibit vigilance for predators while their newly emergent young are foraging but also (n,o) fatten rapidly prior to (p) initiating hibernation in mid- to late-August. Credit: *Royal Society Open Science* (2016). DOI: 10.1098/rsos.160404

(Phys.org)—A team of researchers with members from Northern Arizona University, the University of California and the University of Alaska has found that female Arctic squirrels in Alaska are much busier than males. They have written a paper on their study of the squirrels and have posted it on the open access site *Royal Society Open Science*.

The original purpose of the research was to figure out why males of the species are more prone to being captured and eaten by predators. To find out, they trapped 18 of the males and 30 of the [females](#) and fitted each with tiny photosensitive collars that transmitted information about whether the individual was above or below ground. The collars also had accelerometers that allowed the researchers to track their movements. The team monitored the squirrels living at two sites in 2014 and 2015 in order to carry out charting activities of both genders over the course of yearly cycles.

The researchers found that during the period when they were not hibernating (late spring to early fall), the females kept themselves very busy, both above and below ground, in their nests. The males, on the other hand, engaged in very little activity. The researchers attribute this difference in work ethic to the amount of food the females needed to consume to fatten themselves prior to carrying babies and then to produce milk and to care for offspring after birth. That meant that the females had to forage very assiduously each time they left the nest. The males spent a small amount of time foraging, and the rest of their days above ground lolling about—the researchers are not really sure what they were doing, but suggest they were likely basking in the sun to keep warm. It was this behavior that the researchers believe made them more susceptible to being spotted and eaten by predators. It is assumed that the males were somewhat more energetic during one short time span at least—mating season. Interestingly, the researchers discovered that one male squirrel was busier than all of the other [males](#) and females in the study, but have no explanation for his behavior or any ideas regarding

what he was doing.

**More information:** Cory T. Williams et al. The secret life of ground squirrels: accelerometry reveals sex-dependent plasticity in above-ground activity, *Royal Society Open Science* (2016). [DOI: 10.1098/rsos.160404](https://doi.org/10.1098/rsos.160404)

## Abstract

The sexes differ in how and when they allocate energy towards reproduction, but how this influences phenotypic plasticity in daily activity patterns is unclear. Here, we use collar-mounted light loggers and triaxial accelerometers to examine factors that affect time spent above ground and overall dynamic body acceleration (ODBA), an index of activity-specific energy expenditure, across the active season of free-living, semi-fossorial arctic ground squirrels (*Urocitellus parryii*). We found high day-to-day variability in time spent above ground and ODBA with most of the variance explained by environmental conditions known to affect thermal exchange. In both years, females spent more time below ground compared with males during parturition and early lactation; however, this difference was fourfold larger in the second year, possibly, because females were in better body condition. Daily ODBA positively correlated with time spent above ground in both sexes, but females were more active per unit time above ground. Consequently, daily ODBA did not differ between the sexes when females were early in lactation, even though females were above ground three to six fewer hours each day. Further, on top of having the additional burden of milk production, ODBA data indicate females also had fragmented rest patterns and were more active during late lactation. Our results indicate that sex differences in reproductive requirements can have a substantial influence on activity patterns, but the size of this effect may be dependent on capital resources accrued during gestation

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