

研究论文

# 黑线姬鼠 (*Apodemus agrarius*) 的种群繁殖参数及其地理分异特征

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**摘要** 黑线姬鼠(*Apodemus agrarius*)是我国广大地区的主要害鼠之一, 是余庆县农田害鼠优势种, 占总鼠数的94.81%。探讨其种群繁殖参数的变动规律及其地理分异特征, 对其种群数量预测预报具有重要意义。通过对1987~2005年贵州省余庆县黑线姬鼠种群繁殖参数分析结果表明: 研究期间共解剖标本5497只, 其中, 雌鼠2698只, 雄鼠2799只, 黑线姬鼠在当地1~11月份均可繁殖, 主要繁殖期在3~10月份, 每年4~5月份和8~9月份出现2次妊娠高峰。种群总性比(♀/♂)为0.96, 多年平均怀孕率为36.91%±6.79%, 平均胎仔数为5.33±1.07只, 平均繁殖指数为0.81±0.17, 平均睾丸下降率为59.13%±7.89%。不同年龄组种群繁殖力存在显著差异, 随着种群年龄的增长繁殖力不断增加, 成年I组、成年II组、老年组是种群繁殖的主体。种群繁殖参数不同年度之间比较稳定, 不同月份、不同季节之间变化差异较大, 具有明显的季节变化特征。年均种群密度与年均繁殖指数呈极显著正相关, 与胎仔数显著正相关, 与年均怀孕率、睾丸下降率、性比相关性不显著, 繁殖指数是影响黑线姬鼠种群密度的重要因子。比较全国各地黑线姬鼠种群繁殖参数的地理分异特征认为, 黑线姬鼠种群繁殖参数具有明显的地理分异现象, 胎仔数、生殖强度由南向北逐渐增加, 具有随纬度的升高趋向增加的特征; 在高纬度地区繁殖时间较短; 性比与纬度、经度的变化关系密切; 各繁殖参数与海拔的变化相关性不明显, 可排除海拔因素的影响。

**关键词** [黑线姬鼠](#); [繁殖参数](#); [年龄变化](#); [时间分异](#); [地理分异](#)

**分类号** [Q142](#), [Q958.1](#); [S443.5](#)

## Species reproductive parameters and the comparison of geography variation in *Apodemus agrarius*

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**Abstract** *Apodemus agrarius*, the main pest rat in China, represents 94.81% of all farmland rats in Yuqing County, Guizhou. From 1987-2005, we captured rodents once a month (from 5th-15th day of the month) in rice field and dry field habitats. Captured *A. agrarius* were brought back to laboratory, numbered, measured for morphological characteristics, and then autopsied to determine sex, age and reproductive condition.

A total of 5497 specimens were captured, among which 2698 were male and 2799 were female. The rats bred from January to November, and the most favorable breeding period was March to October. Two reproductive peaks (April-May and August-September) were evident. Sex ratio (♀/♂), the average pregnancy rate, mean litter size, reproductive index and the rate of scrotal testis presence for the whole studey population were 0.96, 36.91%±6.79%, 5.33±1.07, 0.81±0.17 and 59.13%±7.89%, respectively.

Individuals were assigned to five age classes based on either weight or body weight without viscera. Reproductive data of 1261 *A. agrarius* from 1999 to 2005 showed obvious variation with the age. All juveniles were sexually immature with no reproductive activity. The sub-adult group had begun to reproduce with a pregnancy rate is 4.68% and a rate of scrotal testis presence of 14.97%. All of the adult group I, group II and the old group were sexually mature, with a pregnancy rate ranging from 31.62%-68.33% and a rate of scrotal testis presence from 79.39%-100.00%. Reproductive capacity would increase continuously with growth within age categories. Adult group I, group II and the old group were the main reproductive contributors.

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Comparison of reproductive parameters in *A. agrarius* captured from 1987 to 2005 showed that the pregnancy rate, mean litter size, the rate of scrotal testis presence and the reproductive index (except for sex ratio) varied by month and season. However, in different years, only the sex ratio showed significant variation. Reproductive parameters of *A. agrarius* were relatively stable among different years, but fluctuated in different months and different seasons. Correlational analysis of reproductive parameters showed that population densities each year were positively correlated significantly with the reproductive index and mean litter size, whereas there was no correlation between populations and either the pregnancy rate, the rate of scrotal testis presence, or the sex ratio. Population density of *A. agrarius* depends strongly on the reproductive index, which is very useful in forecasting population density for the rodent.

Comparison of reproductive parameters of *A. agrarius* among different areas in China demonstrated obvious regional variation. Mean litter size and reproductive capacity increased gradually from south to north; i.e., the rat's fecundity increased with increasing latitude. However, reproductive period was lower in high-latitude areas. Sex ratio increased from south to north and also from west to east. Reproductive parameters were not correlated with altitude, so this parameter can be eliminated in analysis of the reproductive traits of *A. agrarius*.

**Key words** *Apodemus agrarius*; reproductive parameters; age variation; temporal variation; regional variation

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