

研究论文

捕食和食物交互作用条件下根田鼠季节性波动种群攻击水平及其行为多态性分析

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摘要 在捕食和附加食物交互作用条件下, 以恐吓、进攻、追逐、争斗及回避5类行为为变量, 以恐吓、进攻、追逐计数之和的平均值作为攻击水平, 测定根田鼠种群不同波动时期成体的攻击水平。发现根田鼠的攻击性与种群波动时期之间, 存在明显的关联。统计分析结果表明, 在种群3个波动时期, 4种处理种群两性攻击型个体比例差异显著。除预防捕食者无附加食物 (-P, -F) 种群的雌体外, 其它处理种群增长期和高峰期雌性和雄性攻击型个体的比例高于其衰减期。其中, 预防捕食者附加食物 (-P,+F) 种群、-P, -F种群及未预防捕食者附加食物 (+P,+F) 种群, 雄性攻击型个体的比例均为增长期>高峰期>衰减期; 在未预防捕食者无附加食物 (+P, -F) 种群, 雄性攻击型个体比例为高峰期>增长期>衰减期。各处理种群雌性攻击型个体比例的格局与雄体的不同。其中, -P,+F种群及+P,+F种群为增长期>高峰期>衰减期, +P, -F种群为高峰期>增长期>衰减期, 而-P, -F种群攻击型个体比例为高峰期>衰减期>增长期。虽不同处理种群雌体及雄体的5类行为变量与种群密度的相关性不一致, 而具有明显攻击性的恐吓、进攻及争斗3类行为则分别与种群密度呈显著或极显著的线性正相关关系, 其结果与Chitty多态行为假设预测的一致; 验证了所提出的特定假设: 种群外部因子捕食和食物交互效应介导的攻击行为选择, 是引起田鼠类种群季节性波动的主要内部因子。

关键词 [攻击行为](#); [行为多态性](#); [捕食](#); [食物](#); [根田鼠\(Microtus oeconomus\)](#)

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Analysis on aggressive levels and behavior polymorphism of root voles in seasonal fluctuation populations under the interaction between predation and food availability

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Abstract The relationship between aggression level and fluctuating phase of population density of root voles, *Microtus oeconomus*, was studied under different predation and food treatments, predator-access and food supplemented (+P,+F), predator-excluded and food supplemented (-P,+F), predator-excluded and non-supplemented (-P, -F), and predator-access and non-supplemented (+P, -F). The aggressive behaviors observed in the study were threat, attack, chase, wrestle and retreat. The sum of the accounts of three aggressive behaviors, threat, attack and chase, was defined as aggressive account, which stood for aggression level of the population. The individuals that showed active threat, attack, and chase behavior were defined as aggressive individuals. The results showed that the proportions of aggressive individuals were variable during different fluctuating phases in the four populations. The proportions of aggressive individuals during increase and peak phases were significantly higher than those in decline phase under all treatments except that of females under -P, -F treatment. During the whole fluctuating periods, the average counts of

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f threat, attack and wrestle in every trapping session under all treatments were all significantly positively correlated with population density. In general, experimental data from all root vole populations were consistent with what was predicted by Chitty's polymorphic behavior hypothesis. The experimental results testified our specific hypothesis: aggressive behavior selection, which was mediated by the interaction of predation and food availability as external factors, was the main internal regulating factor in seasonal fluctuating populations of arvicoline rodents.

Key words [aggressive behavior](#) [behavior](#) [polymorphism](#) [predation](#) [food](#) [root vole](#) [Microtus oeconomus](#)

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