

南京农业大学  
2008 年攻读博士学位研究生入学考试试题

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试题编号：3409      试题名称：昆虫生理生化

**注意：答题一律答在答题纸上，答在草稿纸或试卷上一律无效**

一. 简答题（每小题 10 分，共 40 分）

1. 试述昆虫与共生物之间的营养关系。
2. 简述昆虫的化学通讯系统。
3. 简述昆虫胚胎发育的激素调控。
4. 分析植食性昆虫与寄主的协同进化。

二. 论述题（每小题 20 分，共 60 分）

1. 许多高效杀虫剂都是神经毒剂，但由于抗性的形成或对人畜高毒等多种原因，许多以乙酰胆碱酯酶、乙酰胆碱受体和钠离子通道等神经系统基因为作用靶标的杀虫剂相继退出了历史的舞台。请从生殖发育、激素调控、信息素、共生菌等方面阐述开发新型杀虫剂的策略，及其优缺点。
  
2. “Another cause for Morgan’s success is no doubt to be found in the ingenious choice of object for his experiments. .... This animal can easily be kept alive in laboratories, it can well endure the experiments that must be made. It propagates all the year round without intervals. .... This fortunate choice made it possible to Morgan to overtake other prominent genetical scientists, who had begun earlier but employed plants or less suitable animals as experimental objects” 这是诺贝尔奖委员会对摩尔根工作的评价，表明了选择合适的模式生物在揭示生命规律中的重要作用。请问文中提到的“*This animal*”是指哪种昆虫？试述在昆虫生理生化学研究中重要的模式昆虫及其相关的主要研究工作。
  
3. Nearly all insects are bisexual. Several species in different groups are capable of reproducing parthenogenetically; that is, they are able to produce individuals from unfertilized eggs. Some new findings help explain the poorly understood phenomenon of parthenogenesis. Recent research implicates bacteria *Wolbachia*, which can cause cytoplasmic incompatibility in some insects, as the cause. How much do you know *Wolbachia* and its effects on insects?