# 安徽师范大学

## 2019 年硕士研究生招生考试初试试题

科目代码：939

科目名称：普通遗传学

**一、名词解释（每题 5 分，共 60 分）**

1. 基因型与表现型
2. 内含子
3. 等位基因
4. 基因互作
5. 伴性遗传
6. 遗传率
7. 假基因
8. 水平基因转移
9. 非同义替代（突变）
10. 转座子
11. 平衡致死品系
12. 协同进化

**二、简答题（每题 10 分，共 30 分）**

1. 简述染色体结构变异类型及其遗传学效应。

2. 在豌豆中，蔓茎（T）对矮茎（t）是显性，绿豆荚（G）对黄豆荚（g）是显性；圆豆子（R）对皱豆子（r）是显性。现有下列两种杂交组合，问它们后代的表型如何？
（1）TTGgRr × ttGgrr；
（2）TtGgrr × ttGgrr

3. 什么是达尔文正选择和达尔文负选择？谈谈你对二者相互关系的认识。

**三、论述题（20 分）**

1. 生物进化理论中，自然选择学说、分子进化的中性学说和现代综合理论的主要观点是什么？谈谈你对这三种学说之间相互关系的认识。

**四、英译汉（40 分）**

Phylogeography integrates biogeography and genetics to study in greater detail the lineal history of a species in context of the geoclimatic history of the planet. An example study of poison frogs living in the South American neotropics is used to demonstrate how phylogeographers combine genetics and paleogeography to piece together the ecological history of organisms in their environments. Several major geoclimatic events have greatly influenced the biogeographic distribution of organisms in this area, including the isolation and reconnection of South America, the uplift of the Andes, an extensive Amazonian floodbasin system during the Miocene, the formation of Amazon drainages, and dry–wet climate cycles throughout the Pliocene (上新世) to Pleistocene (渐新世) epochs.

Using this contextual paleogeographic information the authors of this study proposed a null-hypothesis that assumes no spatial structure and two alternative hypothesis involving dispersal and other biogeographic constraints. The phylogeographers visited the ranges of each frog species to obtain tissue samples for genetic analysis; researchers can also obtain tissue samples from museum collections.

The evolutionary history and relations among different poison frog species is reconstructed using phylogenetic trees derived from molecular data. The molecular trees are mapped in relation to paleogeographic history of the region for a complete phylogeographic study. The tree shown in the center of the figure has its branch lengths calibrated to a molecular clock, with the geological time bar shown at the bottom. The same phylogenetic tree is duplicated four more times to show where each lineage is distributed and is found.

The combination of techniques used in this study exemplifies more generally how phylogeographic studies proceed and test for patterns of common influence. Paleogeographic data establishes geological time records for historical events that explain the branching patterns in the molecular trees. This study rejected the null model and found that the origin for all extant Amazonian poison frog species primarily stem from fourteen lineages that dispersed into their respective areas after the Miocene floodbasin receded. Regionally based phylogeographic studies of this type are repeated for different species as a means of independent testing. Phylogeographers find broadly concordant and repeated patterns among species in most regions of the planet that is due to a common influence of paleoclimatic history.