

Sexual selection on land snail shell ornamentation: a hypothesis that may explain shell diversity

Abstract

Background: Many groups of land snails show great interspecific diversity in shell ornamentation, which may include spines on the shell and flanges on the aperture. Such structures have been explained as camouflage or defence, but the possibility that they might be under sexual selection has not previously been explored.

Presentation of the hypothesis: The hypothesis that is presented consists of two parts. First, that shell ornamentation is the result of sexual selection. Second, that such sexual selection has caused the divergence in shell shape in different species.

Testing the hypothesis: The first part of the hypothesis may be tested by searching for sexual dimorphism in shell ornamentation in gonochoristic snails, by searching for increased variance in shell ornamentation relative to other shell traits, and by mate choice experiments using individuals with experimentally enhanced ornamentation. The second part of the hypothesis may be tested by comparing sister groups and correlating shell diversity with degree of polygamy.

Implications of the hypothesis: If the hypothesis were true, it would provide an explanation for the many cases of allopatric evolutionary radiation in snails, where shell diversity cannot be related to any niche differentiation or environmental differences.