One Gene Selection

1. Author and Contact Info:

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2. Category: Biology (Population Genetics)

3. Brief Description:

This application is used to simulate natural selection (viability selection) for one genes with two alleles. The program displays graphs of (*i*) the change in allele frequency versus the allele frequency, (*ii*) the mean population fitness versus the allele frequency, (*iii*) the additive genetic variance versus the allele frequency, (*iv*) the allele frequency versus time, (*v*) the mean fitness versus time, and (*vi*) the additive genetic variance versus time. The fitness values can be varied to see the effect on the outcome of selection.

4. How the Application Can be Used:

OneGeneSelection.app was designed to be used in an upper division undergraduate course on population genetics, but it could also be used in an introductory biology course to illustrate and contrast directional *vs*. balancing *vs*. disruptive selection.

5. Developed under NeXTSTEP 2.1

6. Detailed Instructions:

The fitness values are entered into the fields or changed by sliders and then the user click one of the six buttons corresponding to the views (i)±(vi) listed above. For views 4±6, the program will plot several different allele frequencies which will be equally spaced between 0 and 1. You can vary the number of initial allele frequencies and the number of generations by changing the values in the input fields and clicking the button for the appropriate view. A new simulation with the next initial allele frequency is obtained by clicking the button labelled "Do next initial p." For detailed instructions, a description of the model, and some suggested exercises, click the Help button in the Info submenu.

7. Comments:

The help panel can be customized by opening OneGeneSelection.app as a folder and editing the Help.rtf file. This is a good place to enter assignments, questions, exercises, etc.