

Final Exam. Biology 7932. Application of the Generalized Linear Model in Biology.

The final exam is a group project with due date of 10 December 2010.

Write a paper entitled:

The Arcsin Transform: Has the time come for retirement?

in a format suitable for TREE.

The paper should include:

- A. The most frequency cited sources for the use of the arcsin transform
- B. The rationale for the use of the arcsin transform for the analysis of % data, as stated in Sokal and Rohlf (1995) and in other referenced sources.
- C. The frequency of use of the arcsin transform in a leading journal in ecology, in evolutionary biology, in behaviour, and in either biochemistry or physiology. You may also want to include Science and Nature, or a journal that you consider a leading journal in your area of research interest. Journals with publication going back to 1930 will be more informative than recent journals. For each journal show the frequency of use of the transform, by year. For an example see Figure 3 in:
http://www.mun.ca/biology/dschneider/Publications/2001DCS_AIBS_RiseOfScale.pdf
- D. Any references that you encounter that advocate logistic regression instead.
- E. An evaluation of the efficacy of the arcsin transform in addressing violation of assumptions for the GLM, via comparison of residual plots before and after transformation.
- F. An evaluation of the efficacy of the arcsin transform, under the assumptions for the GLM, via at least 2 criteria:
 1. Change in decision before and after transformation, with GLM
 2. Loss (or gain) in power, as judged from increase in Type I error (p-value) or decrease in Type I error (loss of power) with GLM.
- G. An evaluation of the efficacy of the arcsin transform (as above), compared to analysis via logistic regression.
- H. A discussion of trends in the use of the arcsin transform among fields of research, the efficacy of the transform, and your recommendations for continued use, given efficacy.

The analyses upon which the paper is based should be presented in an Appendix, with each analysis in the same format, clearly labelled as to source of data, the person who did the analysis, and other appropriate information such as whether the % data are based on independent trials.

You will need to decide on a format for these, the 10 step recipe is far too detailed.