

Selected

There's a large variety of statistical methods existing. Only a certain part of them is required for evaluation of biotests. Let ToxRat take care for the selection! Statistical methods being relevant in ecotoxicology are waiting for you.

Effective

Simple statistics:

- mean, median, standard deviation, coefficient of variation, confidence interval, minimum and maximum

Statistical testing

- **Variance analysis** (ANOVA, Kruskal-Wallis Test, χ^2 - and exact contingency table tests)
- **Analysis of Variance plus Trend** (Jonckheere-Terpstra, Cochran Armitage)
- **Pretests on normal distribution** (R/S-Test, Kolmogorov-Smirnov Test, Shapiro Wilks Test)
- **Pre-tests on homogeneity of variance** (Cochran, Bartlett, Levene, Tarone test for extrabinomial variance)
- **Tests for monotony** (linear + quadratic contrasts, (Rao-Scott-) Cochran Armitage Trend Test, Jonckheere-Terpstra Trend Test)
- **Pairwise (two-sample) comparisons** (Student-t-Test, Welch-t-Test, Mann-Whitney-U-Test, Mediantest, Fisher Exact Binomial Test, χ^2 Fourfold Table Test)
- **Multiple Comparisons** (t-Test with Bonferroni-Correction, Dunnett Test, Williams Test, Welch-t-Test with Bonferroni-Correction, Step down Jonckheere Terpstra Test, Bonferroni-Median test, Wilcoxon-Mann-Withney-U-Test with Bonferroni Correction, Step down (Rao Scott-) Cochran Armitage Test, χ^2 - and Fisher Exact Test with Bonferroni Correction)
- **Tests for outliers** (Dixon/Grubbs, Hampel outlier test)

Several **data transformations** available

Dose-Response-Curves / Find effect levels: up to 6 user definable effect levels, 95% Confidence limits

Linear regression (metric and quantal variables):

- Functions: Probit, Logit, Weibull
- Fitting algorithms: linear / linear weighted / linear max. likelihood
- Confidence limits: Fieller's Theorem, Normal Approximation, Bootstrap procedure
- Correction of variance for covariance of control
- Abbott Correction
- Parallel Line Assay and Potency Estimation

Non-linear regression (only metric variables):

- 2-3-4 parameter Normal, Sigmoid (Bruce-Versteeg)
- 2-3-4 parameter Logistic
- 2-3-4 Parameter Weibull
- Weighting: relative, Poisson, by variability
- Optimization methods: Levenberg-Marquardt, Downhill-Simplex
- Confidence limits: Monte carlo Simulation, Bootstrap procedure

Interpolation methods to determine the EC50 for quantal data:
(Trimmed) Spearman Kärber, Moving Averages, Binomial estimation

[top](#)