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Analysis of variance. One-way ANOVA.

Investigated experimental factor:  Pb Concentration
Factors name: Control; 0.5 mg/L; 1.0 mg/L; 1.5 mg/L;
Investigated experimental response:  Optical density

*  - The components of observed variance:
          df type I SS mean square  F value    p>F
treatments  3   12.4038      4.1346 121.2121 <0.001
Residuals  24    0.8186      0.0341      -      -

*  - Distribution of variables in variance classes:
  treatment   mean      sd    sem tukey snk duncan NA. scott_knott
1   Control 1.9309 0.2400 0.0698     a   a      a   a           a
2  0.5 mg/L 0.7614 0.2303 0.0698     b   b      b   b           b
3  1.0 mg/L 0.3814 0.0788 0.0698     c   c      c   c           c
4  1.5 mg/L 0.2349 0.1400 0.0698     c   c      c   c           c

*  - The raw multiple comparisons test:
                 pair contrast p(tukey) p(snk) p(duncan)     NA
1  Control - 0.5 mg/L   1.1695   0.0000 0.0000    0.0000 0.0000
2  Control - 1.0 mg/L   1.5495   0.0000 0.0000    0.0000 0.0000
3  Control - 1.5 mg/L   1.6960   0.0000 0.0000    0.0000 0.0000
4 0.5 mg/L - 1.0 mg/L   0.3800   0.0040 0.0008    0.0008 0.0016
5 0.5 mg/L - 1.5 mg/L   0.5265   0.0001 0.0001    0.0000 0.0000
6 1.0 mg/L - 1.5 mg/L   0.1465   0.4622 0.1508    0.1508 0.1508

*  - Normality (Shapiro-Wilk) and homogeneity (Bartlett) tests applied to residuals:
                           values
p.value Shapiro-Wilk test   0.5874
p.value Bartlett test       0.0644
coefficient of variation (%) 22.3300
first value most discrepant  1.0000
second value most discrepant 14.0000
third value most discrepant  12.0000


*   - The estimated marginal means (EMMs) of factors values:
 Concentration emmean     SE df lower.CL upper.CL
 Control         1.931 0.0698 24   1.7868    2.075
 0.5 mg/L        0.761 0.0698 24   0.6174    0.906
 1.0 mg/L        0.381 0.0698 24   0.2374    0.526
 1.5 mg/L        0.235 0.0698 24   0.0908    0.379

Confidence level used: 0.95

*   - The contrasts between factors in terms of estimated marginal mMeans (EMMs):
 contrast                estimate     SE df t.ratio p.value
 Control - (0.5 mg/L)       1.169 0.0987 24  11.846  <.0001
 Control - (1.0 mg/L)       1.549 0.0987 24  15.695  <.0001
 Control - (1.5 mg/L)       1.696 0.0987 24  17.180  <.0001
 (0.5 mg/L) - (1.0 mg/L)    0.380 0.0987 24   3.849  0.0009
 (0.5 mg/L) - (1.5 mg/L)    0.527 0.0987 24   5.334  <.0001
 (1.0 mg/L) - (1.5 mg/L)    0.147 0.0987 24   1.485  0.1506

P value adjustment: fdr method for 6 tests

*   - Calculated p values of pair factor contrasts:
                    contrasts.vals       p.vals
Control - (0.5 mg/L)      1.1694286 3.265623e-11
Control - (1.0 mg/L)      1.5494286 1.209851e-13
Control - (1.5 mg/L)      1.6960000 3.279399e-14
(0.5 mg/L) - (1.0 mg/L)   0.3800000 9.246837e-04
(0.5 mg/L) - (1.5 mg/L)   0.5265714 2.682652e-05
(1.0 mg/L) - (1.5 mg/L)   0.1465714 1.506389e-01
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*    - Benjamini-Krieger-Yekutieli multiple-stages comparison procedure
*      and the decision to reject the null hypothesis of equal means.
                        contrasts.vals        p.vals    BYK.pvals BYK.rejection
Control - (0.5 mg/L)         1.1694286 3.265623e-11 4.354164e-11          TRUE
Control - (1.0 mg/L)         1.5494286 1.209851e-13 3.024627e-13          TRUE
Control - (1.5 mg/L)         1.6960000 3.279399e-14 1.967639e-13          TRUE
(0.5 mg/L) - (1.0 mg/L)      0.3800000 9.246837e-04 3.702158e-04          TRUE
(0.5 mg/L) - (1.5 mg/L)      0.5265714 2.682652e-05 2.012043e-05          TRUE
(1.0 mg/L) - (1.5 mg/L)      0.1465714 1.506389e-01 2.955927e-02          TRUE
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