# Fish, Acute Toxicity Test (OECD 203): 96h Acute Toxicity Test

**General:**

| | |
|---|---|
| Test identification/project no. | 96h Acute Toxicity Test |
| Test item | Barium (BaCl) |
| Unit of test item concentration | mg/L |
| Start of experiment on day | |
| Date and time of the evaluation | 19/09/2018; 1:05:48 PM |
| Raw data filename: Definitive Test.xls | NewOECD203-Fish Acute Toxicity Test1 |

**Test design**

| | |
|---|---|
| Number of treatments (incl. control(s)) | 6 |
| Duration of the test | 96 h |
| Test system | Paratya australiensis |

**Validity of the test**

To be a valid test, a maximum control mortality of 10.0% is allowed.

In the present test 0.0% of the introduced animals died.

Thus the test is valid.

## Relation of Paratya australiensis Endpoints on Concentration

### Summary of Results for all Endpoints at the End of Exposure Period

Tab. 1: Summary of Results for all Endpoints at the End of Exposure Period: Critical effect and threshold concentration as observed at end of experimental time; EC: Effective concentration for xx% reduction; 95%-CL: 95% Confidence limits; LOEC: Lowest observed effect concentration; NOEC: No observed effect concentration

| Critical Conc.s [mg/L] | | 0-96 h |
|---|---|---|
| Survival | | |
| | EC10 | 7.881 |
| 95%-CL | lower | 4.464 |
| | upper | 11.028 |
| | EC20 | 11.449 |
| 95%-CL | lower | 7.426 |
| | upper | 15.013 |
| | EC50 | 23.388 |
| 95%-CL | lower | 18.449 |
| | upper | 28.857 |
| Survival | LOEC | <=10.000 |
| | NOEC | <10.000 |

n.d.: not determined due to mathematical reasons or inappropriate data

### Survival of Paratya australiensis as Dependent on Concentration

Tab. 2: Survival of Paratya australiensis as dependent on concentration of the test item; Mean: arithmetic mean; Std.Dev.: standard deviation; n: number of replicates; CV: coefficient of variation (from InputRawData)

| Treatm. [mg/L] | Control | 10.000 | 18.000 | 32.400 | 58.300 | 105.000 |
|---|---|---|---|---|---|---|
| 0 h | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 7 | 7 | 7 | 7 |
| Total Introduced: | 28 | 28 | 28 | 28 | 28 | 28 |
| n: | 4 | 4 | 4 | 4 | 4 | 4 |

Tab. 2 (continued): Survival of Paratya australiensis as dependent on concentration of the test item; Mean: arithmetic mean; Std.Dev.: standard deviation; n: number of replicates; CV: coefficient of variation (from InputRawData)

| | | | | | | |
|---|---|---|---|---|---|---|
| 24 h | 7 | 7 | 7 | 7 | 6 | 5 |
| | 7 | 7 | 7 | 6 | 7 | 7 |
| | 7 | 7 | 7 | 6 | 7 | 6 |
| | 7 | 7 | 7 | 7 | 5 | 5 |
| Total Survived: | 28 | 28 | 28 | 26 | 25 | 23 |
| n: | 4 | 4 | 4 | 4 | 4 | 4 |
| 48 h | 7 | 7 | 6 | 5 | 4 | 1 |
| | 7 | 7 | 6 | 4 | 5 | 1 |
| | 7 | 7 | 7 | 3 | 4 | 3 |
| | 7 | 7 | 5 | 2 | 3 | 1 |
| Total Survived: | 28 | 28 | 24 | 14 | 16 | 6 |
| n: | 4 | 4 | 4 | 4 | 4 | 4 |
| 72 h | 7 | 7 | 6 | 4 | 1 | 0 |
| | 7 | 7 | 6 | 2 | 3 | 0 |
| | 7 | 7 | 4 | 2 | 2 | 0 |
| | 7 | 7 | 4 | 2 | 1 | 0 |
| Total Survived: | 28 | 28 | 20 | 10 | 7 | 0 |
| n: | 4 | 4 | 4 | 4 | 4 | 4 |
| 96 h | 7 | 5 | 6 | 4 | 1 | 0 |
| | 7 | 5 | 5 | 2 | 2 | 0 |
| | 7 | 7 | 3 | 1 | 2 | 0 |
| | 7 | 6 | 4 | 2 | 1 | 0 |
| Total Survived: | 28 | 23 | 18 | 9 | 6 | 0 |
| n: | 4 | 4 | 4 | 4 | 4 | 4 |

## Mortality as Dependent on Concentration and Time

Tab. 3: Cumulative mortality of Paratya australiensis as dependent on concentration of the test item and time (from InputRawData)

| Treatm. [mg/L] | Control | 10.000 | 18.000 | 32.400 | 58.300 | 105.000 |
|---|---|---|---|---|---|---|
| 0 h: | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 24 h: | 0 | 0 | 0 | 2 | 3 | 5 |
| 48 h: | 0 | 0 | 4 | 14 | 12 | 22 |
| 72 h: | 0 | 0 | 8 | 18 | 21 | 28 |
| 96 h: | 0 | 5 | 10 | 19 | 22 | 28 |

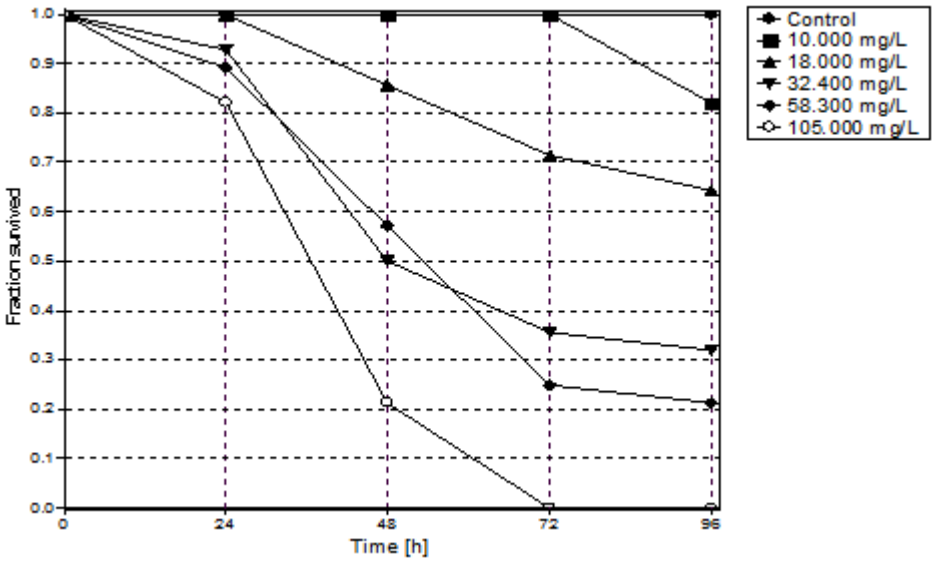


Fig. 1: Survival of the introduced Paratya australiensis as observed under presence of the test item.

### Overview Survival

Tab. 4: % Mortality caused by the test item at 24 h.

| Treatm.[mg/L] | Introduced | Survived | Dead | % Mortality |
|---|---|---|---|---|
| Control | 28 | 28 | 0 | 0.0 |
| 10.000 | 28 | 28 | 0 | 0.0 |
| 18.000 | 28 | 28 | 0 | 0.0 |
| 32.400 | 28 | 26 | 2 | 7.1 |
| 58.300 | 28 | 25 | 3 | 10.7 |
| 105.000 | 28 | 23 | 5 | 17.9 |

## Effective Concentrations (ECx) for Survival at 24 h

### Probit analysis using linear max. likelihood regression

Tab. 5: Probit analysis using linear max. likelihood regression: Determination of the concentration/response function; data is shown which entered the probit analysis; Log(x): logarithm of the concentration; n: number of organisms; Emp. Probit: empirical probit; Reg. Probit: calculated probit for the final function.

| Treatm. [mg/L] | Log(x) | % Mortality | n | Emp. Probit | Weight | Reg. Probit |
|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Control | | 0.00 | 28 | | excluded |
| 10.000 | 1.000 | 0.00 | 28 | -1.2533 | 0.990-2.651 |
| 18.000 | 1.255 | 0.00 | 28 | -1.2533 | 2.581-2.198 |
| 32.400 | 1.511 | 7.14 | 28 | -1.0743 | 5.460-1.745 |
| 58.300 | 1.766 | 10.71 | 28 | -0.9847 | 9.479-1.292 |
| 105.000 | 2.021 | 17.86 | 28 | -0.8057 | 13.740-0.839 |

excluded: value not in line with the chosen function

## Parameters of the probit analysis

Tab. 6: Parameters of the probit analysis: Results of the regression analysis

| Parameter | Value |
|---|---|
| Computation runs: | 8 |
| Slope b: | 1.77424 |
| Intercept a: | -4.42498 |
| Variance of b: | 0.39923 |
| Goodness of Fit | |
| Chi²: | 1.31065 |
| Degrees of freedom: | 3 |
| p(Chi²): | 0.72661 |
| Log EC50: | 2.49401 |
| SE Log EC50: | 0.27727 |
| g-Criterion: | 0.48720 |
| F: | 18.048 |
| p(F) (df: 1;3): | 0.024 |

Chi² is a goodness of fit measure. If the probability, p(Chi²), is lower or equal than 0.100, data is much scattering round the computed dose/response function. In this case and with quantal data, confidence limits are corrected for heterogeneity(= are made wider; so, check whether these results are reasonable!).

## Results of the probit analysis

Tab. 7: Results of the probit analysis: Selected effective concentrations (ECx) of the test item and their 95%- and 99%-confidence limits (according to Fieller`s theorem).

| Parameter | EC10 | EC20 | EC50 |
|---|---|---|---|
| Value [mg/L] | 59.115 | 104.629 | n.d. |
| lower 95%-cl | 31.948 | 66.290 | n.d. |
| upper 95%-cl | 111.657 | 498.814 | n.d. |
| lower 99%-cl | 26.245 | 48.274 | n.d. |
| upper 99%-cl | 135.921 | 684.971 | n.d. |

n.d.: not determined due to mathematical reasons or inappropriate data

Slope function after Litchfield and Wilcoxon: 3.661

(The slope function is derived from the slope, b, of the linearized probit function and computes as S = 10^(1/b); please note that small values refer to a steep concentration/responserelation and large ones to a flat relation.)

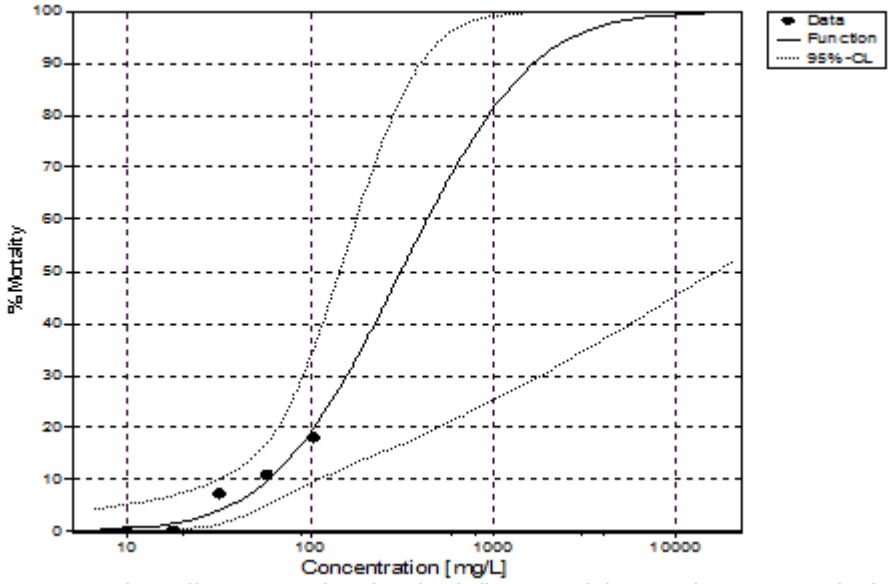


Fig. 2: Concentration-effect curve showing the influence of the test item on survival of the introduced Paratya australiensis as observed after 24 h.

## Effective Concentrations (ECx) for Survival at 48 h

### Probit analysis using linear max. likelihood regression

Tab. 8: Probit analysis using linear max. likelihood regression: Determination of the concentration/response function; data is shown which entered the probit analysis; Log(x): logarithm of the concentration; n: number of organisms; Emp. Probit: empirical probit; Reg. Probit: calculated probit for the final function.

| Treatm. [mg/L] | Log(x) | % Mortality | n | Emp. Probit | WeightReg. Probit |
|---|---|---|---|---|---|
| Control | | 0.00 | 28 | | excluded |
| 10.000 | 1.000 | 0.00 | 28 | -1.2533 | 5.818-1.700 |
| 18.000 | 1.255 | 14.29 | 28 | -0.8952 | 11.504-1.082 |
| 32.400 | 1.511 | 50.00 | 28 | 0.0000 | 16.474-0.464 |
| 58.300 | 1.766 | 42.86 | 28 | -0.1790 | 17.6740.153 |
| 105.000 | 2.021 | 78.57 | 28 | 0.7162 | 14.3130.771 |

excluded: value not in line with the chosen function

### Parameters of the probit analysis

Tab. 9: Parameters of the probit analysis: Results of the regression analysis

| Parameter | Value |
|---|---|
| Computation runs: | 6 |
| Slope b: | 2.41987 |
| Intercept a: | -4.11973 |

| | |
|---|---|
| Variance of b: | 0.15111 |
| Goodness of Fit | |
| Chi²: | 7.40877 |
| Degrees of freedom: | 3 |
| p(Chi²): | 0.05995 |
| Log EC50: | 1.70246 |
| SE Log EC50: | 0.05352 |
| g-Criterion: | 0.64527 |
| F: | 15.691 |
| p(F) (df: 1;3): | 0.029 |

Chi² is a goodness of fit measure. If the probability, p(Chi²), is lower or equal than 0.100, data is much scattering round the computed dose/response function. In this case and with quantal data, confidence limits are corrected for heterogeneity(= are made wider; so, check whether these results are reasonable!).

## Results of the probit analysis

Tab. 10: Results of the probit analysis: Selected effective concentrations (ECx) of the test item and their 95%- and 99%-confidence limits (according to Fieller`s theorem).

| Parameter | EC10 | EC20 | EC50 |
|---|---|---|---|
| Value [mg/L] | 14.889 | 22.629 | 50.403 |
| lower 95%-cl | 0.217 | 1.606 | 25.229 |
| upper 95%-cl | 28.419 | 40.696 | 236.769 |
| lower 99%-cl | 0.028 | 0.416 | 9.899 |
| upper 99%-cl | 217.821 | 157.066 | 603.426 |

n.d.: not determined due to mathematical reasons or inappropriate data

Slope function after Litchfield and Wilcoxon: 2.590

(The slope function is derived from the slope, b, of the linearized probit function and computes as S = 10^(1/b); please note that small values refer to a steep concentration/responserelation and large ones to a flat relation.)

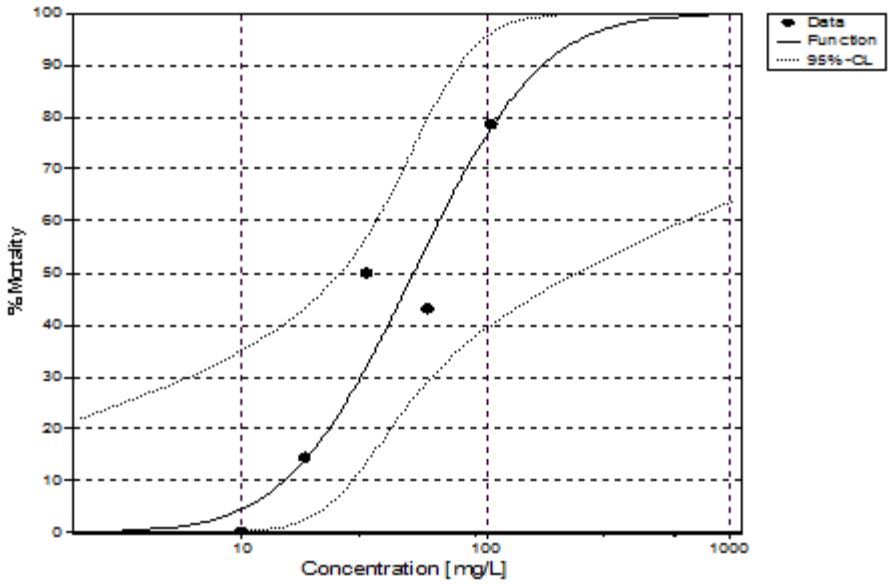


Fig. 3: Concentration-effect curve showing the influence of the test item on survival of the introduced Paratya australiensis as observed after 48 h.

## Effective Concentrations (ECx) for Survival at 72 h

### Probit analysis using linear max. likelihood regression

Tab. 11: Probit analysis using linear max. likelihood regression: Determination of the concentration/response function; data is shown which entered the probit analysis; Log(x): logarithm of the concentration; n: number of organisms; Emp. Probit: empirical probit; Reg. Probit: calculated probit for the final function.

| Treatm. [mg/L] | Log(x) | % Mortality | n | Emp. Probit | WeightReg. Probit |
|---|---|---|---|---|---|
| Control | | 0.00 | 28 | | excluded |
| 10.000 | 1.000 | 0.00 | 28 | -1.2533 | 5.890-1.691 |
| 18.000 | 1.255 | 28.57 | 28 | -0.5371 | 14.327-0.770 |
| 32.400 | 1.511 | 64.29 | 28 | 0.3581 | 17.6770.152 |
| 58.300 | 1.766 | 75.00 | 28 | 0.6267 | 11.5941.073 |
| 105.000 | 2.021 | 100.00 | 28 | 1.2533 | 3.7021.995 |

excluded: value not in line with the chosen function

### Parameters of the probit analysis

Tab. 12: Parameters of the probit analysis: Results of the regression analysis

| Parameter | Value |
|---|---|
| Computation runs: | 6 |
| Slope b: | 3.60959 |
| Intercept a: | -5.30059 |
| Variance of b: | 0.24232 |
| Goodness of Fit | |

| | |
|---|---|
| Chi²: | 6.15233 |
| Degrees of freedom: | 3 |
| p(Chi²): | 0.10443 |
| Log EC50: | 1.46848 |
| SE Log EC50: | 0.03800 |
| g-Criterion: | 0.07145 |
| F: | 26.218 |
| p(F) (df: 1;3): | 0.014 |

Chi² is a goodness of fit measure. If the probability, p(Chi²), is lower or equal than 0.100, data is much scattering round the computed dose/response function. In this case and with quantal data, confidence limits are corrected for heterogeneity(= are made wider; so, check whether these results are reasonable!).

## Results of the probit analysis

Tab. 13: Results of the probit analysis: Selected effective concentrations (ECx) of the test item and their 95%- and 99%-confidence limits (according to Fieller`s theorem).

| Parameter | EC10 | EC20 | EC50 |
|---|---|---|---|
| Value [mg/L] | 12.985 | 17.191 | 29.409 |
| lower 95%-cl | 9.027 | 12.969 | 24.579 |
| upper 95%-cl | 16.423 | 20.923 | 35.088 |
| lower 99%-cl | 8.217 | 12.030 | 23.242 |
| upper 99%-cl | 18.043 | 22.556 | 37.107 |

n.d.: not determined due to mathematical reasons or inappropriate data

Slope function after Litchfield and Wilcoxon: 1.893

(The slope function is derived from the slope, b, of the linearized probit function and computes as S = 10^(1/b); please note that small values refer to a steep concentration/responserelation and large ones to a flat relation.)

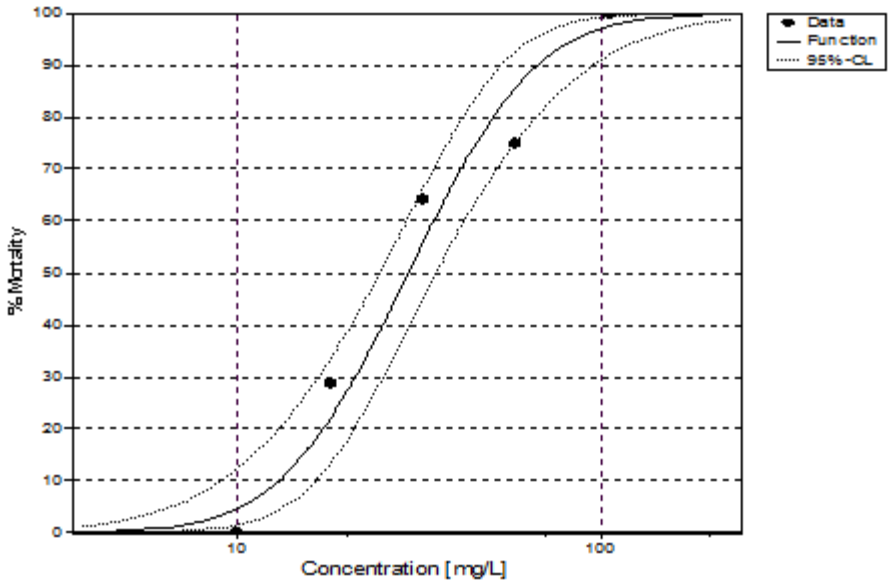


Fig. 4: Concentration-effect curve showing the influence of the test item on survival of the introduced Paratya australiensis as observed after 72 h.

## Effective Concentrations (ECx) for Survival at 96 h

### Probit analysis using linear max. likelihood regression

Tab. 14: Probit analysis using linear max. likelihood regression: Determination of the concentration/response function; data is shown which entered the probit analysis; Log(x): logarithm of the concentration; n: number of organisms; Emp. Probit: empirical probit; Reg. Probit: calculated probit for the final function.

| Treatm. [mg/L] | Log(x) | % Mortality | n | Emp. Probit | WeightReg. Probit |
|---|---|---|---|---|---|
| Control | | 0.00 | 28 | | excluded |
| 10.000 | 1.000 | 17.86 | 28 | -0.8057 | 12.272-1.001 |
| 18.000 | 1.255 | 35.71 | 28 | -0.3581 | 17.218-0.309 |
| 32.400 | 1.511 | 67.86 | 28 | 0.4476 | 16.8920.384 |
| 58.300 | 1.766 | 78.57 | 28 | 0.7162 | 11.5611.076 |
| 105.000 | 2.021 | 100.00 | 28 | 1.2533 | 5.2701.769 |

excluded: value not in line with the chosen function

### Parameters of the probit analysis

Tab. 15: Parameters of the probit analysis: Results of the regression analysis

| Parameter | Value |
|---|---|
| Computation runs: | 5 |
| Slope b: | 2.71297 |
| Intercept a: | -3.71402 |
| Variance of b: | 0.16532 |
| Goodness of Fit | |

| | |
|---|---|
| Chi²: | 2.60854 |
| Degrees of freedom: | 3 |
| p(Chi²): | 0.45599 |
| Log EC50: | 1.36899 |
| SE Log EC50: | 0.04729 |
| g-Criterion: | 0.08629 |
| F: | 51.201 |
| p(F) (df: 1;3): | 0.006 |

Chi² is a goodness of fit measure. If the probability, p(Chi²), is lower or equal than 0.100, data is much scattering round the computed dose/response function. In this case and with quantal data, confidence limits are corrected for heterogeneity(= are made wider; so, check whether these results are reasonable!).

## Results of the probit analysis

Tab. 16: Results of the probit analysis: Selected effective concentrations (ECx) of the test item and their 95%- and 99%-confidence limits (according to Fieller`s theorem).

| Parameter | EC10 | EC20 | EC50 |
|---|---|---|---|
| Value [mg/L] | 7.881 | 11.449 | 23.388 |
| lower 95%-cl | 4.464 | 7.426 | 18.449 |
| upper 95%-cl | 11.028 | 15.013 | 28.857 |
| lower 99%-cl | 3.873 | 6.648 | 17.197 |
| upper 99%-cl | 12.713 | 16.769 | 30.959 |

n.d.: not determined due to mathematical reasons or inappropriate data

Slope function after Litchfield and Wilcoxon: 2.337

(The slope function is derived from the slope, b, of the linearized probit function and computes as S = 10^(1/b); please note that small values refer to a steep concentration/responserelation and large ones to a flat relation.)

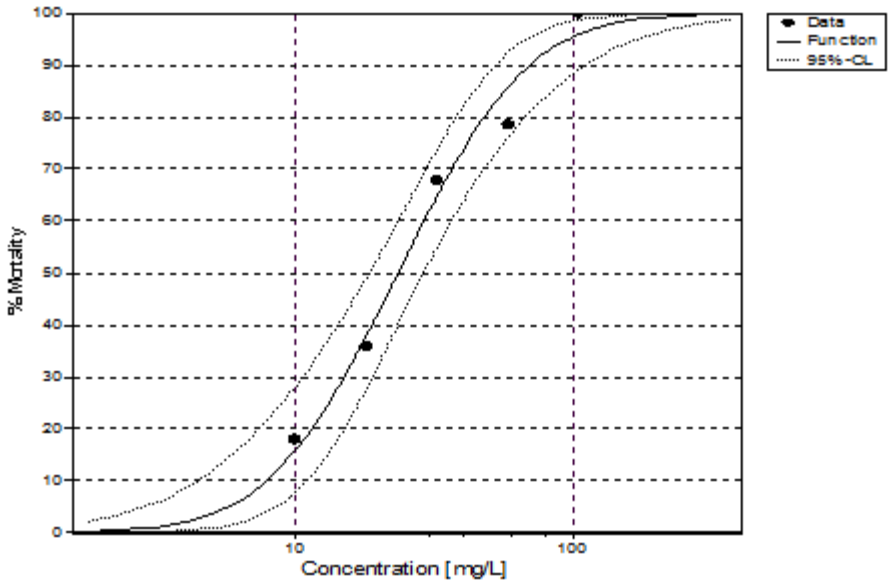


Fig. 5: Concentration-effect curve showing the influence of the test item on survival of the introduced Paratya australiensis as observed after 96 h.

## Overview over the ECs of the Test Item on Survival

### Effects on Survival

Tab. 17: Survival (S) and percent mortality (%M) as computed from the raw data for test intervals selected; ECxx: effect levels as selected; lower 95%-cl, upper 95%-cl: lower and upper 95%-confidence limits.; *pm: Probit analysis using linear max. likelihood regression.

| Treatment | 0-24 h | | 0-48 h | | 0-72 h | | 0-96 h | |
|---|---|---|---|---|---|---|---|---|
| [mg/L] | S | %M | S | %M | S | %M | S | %M |
| Control | 28 | 0.0 | 28 | 0.0 | 28 | 0.0 | 28 | 0.0 |
| 10.000 | 28 | 0.0 | 28 | 0.0 | 28 | 0.0 | 23 | 17.9 |
| 18.000 | 28 | 0.0 | 24 | 14.3 | 20 | 28.6 | 18 | 35.7 |
| 32.400 | 26 | 7.1 | 14 | 50.0 | 10 | 64.3 | 9 | 67.9 |
| 58.300 | 25 | 10.7 | 16 | 42.9 | 7 | 75.0 | 6 | 78.6 |
| 105.000 | 23 | 17.9 | 6 | 78.6 | 0 | 100.0 | 0 | 100.0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EC10 | 59.115 | *pm | 14.889 | *pm | 12.985 | *pm | 7.881 | *pm |
| lower 95%-cl | 31.948 | | 0.217 | | 9.027 | | 4.464 | |
| upper 95%-cl | 111.657 | | 28.419 | | 16.423 | | 11.028 | |
| EC20 | 104.629 | *pm | 22.629 | *pm | 17.191 | *pm | 11.449 | *pm |
| lower 95%-cl | 66.290 | | 1.606 | | 12.969 | | 7.426 | |
| upper 95%-cl | 498.814 | | 40.696 | | 20.923 | | 15.013 | |
| EC50 | | n.d. | 50.403 | *pm | 29.409 | *pm | 23.388 | *pm |
| lower 95%-cl | | n.d. | 25.229 | | 24.579 | | 18.449 | |
| upper 95%-cl | | n.d. | 236.769 | | 35.088 | | 28.857 | |

## Threshold Concentrations (NOEC) for Survival at 24 h

### Fisher`s Exact Binomial Test with Bonferroni Correction

Tab. 18: Fisher`s Exact Binomial Test with Bonferroni Correction: Pair-wise comparisons between treatment and control on the multiple significance level (alpha is 0.05; one-sided greater). Pair-wise comparisons are performed sequentially using the adjusted Alpha* (= alpha/(k-1); k: number of comparisons (after Holm 1979)); Ho (no effect)is accepted, if the probability p > Alpha*.

| Treatm.[mg/L] | Introduced | Survived | Dead | % Mortality | p | alpha* | sign. |
|---|---|---|---|---|---|---|---|
| Control | 28 | 28 | 0 | 0.0 | | | |
| 10.000 | 28 | 28 | 0 | 0.0 | 1.000 | 0.050 | - |
| 18.000 | 28 | 28 | 0 | 0.0 | 1.000 | 0.025 | - |
| 32.400 | 28 | 26 | 2 | 7.1 | 0.245 | 0.017 | - |
| 58.300 | 28 | 25 | 3 | 10.7 | 0.118 | 0.013 | - |
| 105.000 | 28 | 23 | 5 | 17.9 | 0.026 | 0.010 | - |

+: significant; -: non-significant

The NOEC appears to be higher than or equal 105.000 mg/L.

## Threshold Concentrations (NOEC) for Survival at 48 h

### Fisher`s Exact Binomial Test with Bonferroni Correction

Tab. 19: Fisher`s Exact Binomial Test with Bonferroni Correction: Pair-wise comparisons between treatment and control on the multiple significance level (alpha is 0.05; one-sided greater). Pair-wise comparisons are performed sequentially using the adjusted Alpha* (= alpha/(k-1); k: number of comparisons (after Holm 1979)); Ho (no effect)is accepted, if the probability p > Alpha*.

| Treatm.[mg/L] | Introduced | Survived | Dead | % Mortality | p | alpha* | sign. |
|---|---|---|---|---|---|---|---|
| Control | 28 | 28 | 0 | 0.0 | | | |
| 10.000 | 28 | 28 | 0 | 0.0 | 1.000 | 0.050 | - |
| 18.000 | 28 | 24 | 4 | 14.3 | 0.056 | 0.025 | - |
| 32.400 | 28 | 14 | 14 | 50.0 | <0.001 | 0.013 | + |
| 58.300 | 28 | 16 | 12 | 42.9 | <0.001 | 0.017 | + |
| 105.000 | 28 | 6 | 22 | 78.6 | <0.001 | 0.010 | + |

+: significant; -: non-significant

A NOEC of 18.000 mg/L is suggested by the program.

## Threshold Concentrations (NOEC) for Survival at 72 h

### Fisher`s Exact Binomial Test with Bonferroni Correction

Tab. 20: Fisher`s Exact Binomial Test with Bonferroni Correction: Pair-wise comparisons between treatment and control on the multiple significance level (alpha is 0.05; one-sided greater). Pair-wise comparisons are performed sequentially using the adjusted Alpha* (= alpha/(k-1); k: number of comparisons (after Holm 1979)); Ho (no effect)is accepted, if the probability p > Alpha*.

| Treatm.[mg/L] | Introduced | Survived | Dead | % Mortality | p | alpha* | sig |
|---|---|---|---|---|---|---|---|

| n. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Control | 28 | 28 | 0 | 0.0 | | | |
| 10.000 | 28 | 28 | 0 | 0.0 | 1.000 | 0.050 | - |
| 18.000 | 28 | 20 | 8 | 28.6 | 0.002 | 0.025 | + |
| 32.400 | 28 | 10 | 18 | 64.3 | <0.001 | 0.017 | + |
| 58.300 | 28 | 7 | 21 | 75.0 | <0.001 | 0.013 | + |
| 105.000 | 28 | 0 | 28 | 100.0 | <0.001 | 0.010 | + |

+: significant; -: non-significant

A NOEC of 10.000 mg/L is suggested by the program.

## Threshold Concentrations (NOEC) for Survival at 96 h

### Fisher`s Exact Binomial Test with Bonferroni Correction

Tab. 21: Fisher`s Exact Binomial Test with Bonferroni Correction: Pair-wise comparisons between treatment and control on the multiple significance level (alpha is 0.05; one-sided greater). Pair-wise comparisons are performed sequentially using the adjusted Alpha* (= alpha/(k-1); k: number of comparisons (after Holm 1979)); Ho (no effect)is accepted, if the probability p > Alpha*.

| Treatm.[mg/L] | Introduced | Survived | Dead | % Mortality | p | alpha* | sig n. |
|---|---|---|---|---|---|---|---|
| Control | 28 | 28 | 0 | 0.0 | | | |
| 10.000 | 28 | 23 | 5 | 17.9 | 0.026 | 0.050 | + |
| 18.000 | 28 | 18 | 10 | 35.7 | <0.001 | 0.025 | + |
| 32.400 | 28 | 9 | 19 | 67.9 | <0.001 | 0.017 | + |
| 58.300 | 28 | 6 | 22 | 78.6 | <0.001 | 0.013 | + |
| 105.000 | 28 | 0 | 28 | 100.0 | <0.001 | 0.010 | + |

+: significant; -: non-significant

The NOEC is lower than 10.000 mg/L.

## Overview over the Effect-Thresholds of the Test Item on Survival

### Overview over the LOEC and NOEC Determination

Tab. 22: Overview over the LOEC and NOEC Determination: Survival rates and significance marks as computed for survival for all inspection intervals (top); ; bottom part: obtained LOEC and NOEC with indication of statistical test used; *bf: Fisher`s exact binomial test with Bonferroni correction.

| Treatm. [mg/L] | 0-24 h | 0-48 h | 0-72 h | 0-96 h |
|---|---|---|---|---|
| 10.000 | 0.0 - | 0.0 - | 0.0 - | 17.9+ |
| 18.000 | 0.0 - | 14.3 - | 28.6+ | 35.7+ |
| 32.400 | 7.1 - | 50.0+ | 64.3+ | 67.9+ |
| 58.300 | 10.7 - | 42.9+ | 75.0+ | 78.6+ |
| 105.000 | 17.9 - | 78.6+ | 100.0+ | 100.0+ |
| | | | | |
| LOEC | >105.000 *bf | 32.400 *bf | 18.000 *bf | <=10.000 *bf |
| NOEC | >=105.000 *bf | 18.000 *bf | 10.000 *bf | <10.000 *bf |

+: Significant difference to control (p <=0.05)