**SUPPLEMENTARY MATERIAL**

**Table S1a** 24 and 48 hours mortality data of Dichlorvos concentrations acting on *Amietrophrynus regularis* tadpoles in a forced exposure system.

|  |  |  |
| --- | --- | --- |
|   |  | MORTALITY / PERCENTAGE  |
| CONCENTRATION  | TOTAL EXPOSED |  24HRS |  % | 48HRS |  % |
| CPT1 (0 mg/L) | 16 | 0 | 0 | 0 | 0 |
| CPT2 (0.3 mg/L) | 16 | 3 | 18.75 | 5 | 31.25 |
| CPT3 (0.5 mg/L) | 16 | 3 | 18.75 | 6 | 37.50 |
| CPT4 (0.7 mg/L) | 16 | 3 | 18.75 | 9 | 56.25 |
| CPT5 (1 mg/L) | 16 | 4 | 25.00 | 9 | 56.25 |
| CPT6 (2 mg/L) | 16 | 5 | 31.25 | 10 | 62.50 |

**Table S1b** 24- and 48-hours mortality data of Paraquat concentrations acting on *Amietrophrynus regularis* tadpoles in a forced exposure system.

|  |  |  |
| --- | --- | --- |
|   |  | MORTALITY / PERCENTAGE |
| CONCENTRATION  | TOTAL EXPOSED |  24HRS |  % | 48HRS |  % |
| CPT1 (0 mg/L) | 12 | 0 | 0 | 0 | 0 |
| CPT2 (1 mg/L) | 12 | 0 | 0 | 0 | 0 |
| CPT3 (5 mg/L) | 12 | 0 | 0 | 3 | 25 |
| CPT4 (10 mg/L) | 12 | 3 | 25 | 6 | 50 |
| CPT5 (15 mg/L) | 12 | 5 | 41.67 | 11 | 91.67 |
| CPT6 (20 mg/L) | 12 | 9 | 75 | 12 | 100 |

**Table S2a** Number of observed organisms (NO), Number of expected organisms (NE), Avoidance (NA) and percentage avoidance data of *Amietrophrynus regularis* tadpoles exposed to Dichlorvos and observed over 1, 2 and 3-hours periods.

|  |  |  |  |
| --- | --- | --- | --- |
| COMPARTMENT | ONE HOUR | TWO HOURS | THREE HOURS |
| (CONCENTRATION) | NE | NO | NA | %NA | NO | NA | %NA | NO | NA | %NA |
| CPT1 (0 mg/L) | 72 | 72 | 0 | 0 | 72 | 0 | 0 | 72 | 0 | 0 |
| CPT2 (0.3 mg/L) | 60 | 35 | 25 | 41.67 | 30 | 30 | 50.00 | 20 | 40 | 66.67 |
| CPT3 (0.5 mg/L) | 48 | 24 | 24 | 50.00 | 18 | 30 | 62.50 | 11 | 37 | 77.08 |
| CPT4 (0.7 mg/L) | 36 | 16 | 20 | 55.56 | 10 | 26 | 72.22 | 5 | 31 | 86.11 |
| CPT5 (1 mg/L) | 24 | 15 | 9 | 37.50 | 9 | 15 | 62.50 | 4 | 20 | 83.33 |
| CPT6 (2 mg/L) | 12 | 11 | 1 | 8.33 | 7 | 5 | 42.67 | 4 | 8 | 66.67 |

**Table S2b** Number of observed organisms (NO), Number of expected organisms (NE), Avoidance (NA) and percentage avoidance (%NA) data of *Amietrophrynus regularis* tadpoles exposed to Paraquat and observed over 1, 2 and 3-hours.

|  |  |  |  |
| --- | --- | --- | --- |
| COMPARTMENT  | ONE HOUR | TWO HOURS | THREE HOURS |
| (CONCENTRATION) | NE | NO | NA |  %NA | NO | NA |  %NA | NO | NA |  %NA |
| CPT1 (0 mg/L) | 72 | 72 | 0 | 0 | 72 | 0 | 0 | 72 | 0 | 0 |
| CPT2 (1 mg/L) | 60 | 25 | 35 | 58.33 | 16 | 44 | 73.33 | 13 | 47 | 78.33 |
| CPT3 (5 mg/L) | 48 | 8 | 40 | 83.33 | 4 | 44 | 91.67 | 4 | 44 | 91.67 |
| CPT4 (10 mg/L) | 36 | 3 | 33 | 91.67 | 2 | 34 | 94.44 | 2 | 34 | 94.44 |
| CPT5 (15 mg/L) | 24 | 2 | 22 | 91.67 | 0 | 24 | 100 | 0 | 24 | 100 |
| CPT6 (20 mg/L) | 12 | 0 | 12 | 100 | 0 | 12 | 100 | 0 | 12 | 100 |

**Table S2c** Mean percentage distribution and standard deviation (n = 9 observation periods of 20 mins each) of tadpoles of African common toad (*Amietophrynus regularis*) exposed to a contamination gradient of Dichlorvos recorded in each compartment (#) for 3 h. Different letters indicate statistically significant differences.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time (min) | **#1** | **#2** | **#3** | **#4** | **#5** | **#6** |
| 20 | 34.72 | 18.06 | 8.33 | 8.33 | 12.50 | 18.06 |
| 40 | 52.78 | 5.56 | 5.56 | 9.72 | 11.11 | 15.28 |
| 60 | 51.39 | 15.28 | 11.11 | 1.39 | 5.56 | 15.28 |
| 80 | 55.56 | 11.11 | 8.33 | 5.56 | 8.33 | 11.11 |
| 100 | 59.72 | 9.72 | 4.17 | 8.33 | 8.33 | 9.72 |
| 120 | 57.60 | 17.69 | 10.96 | 1.32 | 2.78 | 9.58 |
| 140 | 66.67 | 4.17 | 6.94 | 11.11 | 2.78 | 8.33 |
| 160 | 72.11 | 8.66 | 5.56 | 5.49 | 1.39 | 6.95 |
| 180 | 70.83 | 12.50 | 9.72 | 1.39 | 0.00 | 5.56 |
| Mean | 57.93A | 11.42B | 7.85BC | 5.85C | 5.86C | 11.10B |
| ±SD  | 11.51 | 4.96 | 2.48 | 3.80 | 4.43 | 4.23 |

**Table S2d** Mean percentage distribution and standard deviation (n = 9 observation periods of 20 mins each) of tadpoles of African common toad (*Amietophrynus regularis*) exposed to a contamination gradient of Paraquat recorded in each compartment (#) for 3 h. Different letters indicate statistically significant differences.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time (min) | **#1** | **#2** | **#3** | **#4** | **#5** | **#6** |
| 20 | 43.06 | 36.11 | 12.50 | 4.17 | 2.78 | 1.39 |
| 40 | 56.94 | 25.00 | 13.89 | 1.39 | 1.39 | 1.39 |
| 60 | 65.28 | 23.61 | 6.94 | 1.39 | 2.78 | 0.00 |
| 80 | 65.28 | 22.22 | 8.33 | 2.78 | 1.39 | 0.00 |
| 100 | 70.83 | 23.61 | 4.17 | 1.39 | 0.00 | 0.00 |
| 120 | 77.82 | 16.79 | 2.63 | 2.86 | 0.00 | 0.00 |
| 140 | 79.17 | 15.28 | 4.17 | 1.39 | 0.00 | 0.00 |
| 160 | 79.17 | 12.50 | 6.94 | 1.39 | 0.00 | 0.00 |
| 180 | 81.94 | 12.50 | 2.78 | 2.78 | 0.00 | 0.00 |
| Mean | 68.83a | 20.85b | 6.93c | 2.17cd | 0.93d | 0.31d |
| ±SD  | 12.75 | 7.54 | 4.07 | 1.02 | 1.20 | 0.61 |

**Table S3a** Results of the mixed-design ANOVA for the distribution (%) of tadpole in the control test in the linear system. Observation times were treated as a within-subjects factor (repeated measures) and compartments were considered a between-subjects factor. Mauchly's Test was used to check the sphericity of the repeated measures.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Within subjects effect | Mauchly W | Approx. chi-square | Degrees of freedom | Significance (p) |
|  |
| Time | 0.078 | 38.609 | 35 | 0.335 |  |

**Table S3b** Tests of within-subjects effects assuming sphericity:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | Sum of squares | Degrees of freedom | Mean square | F | Significance (p) |
| Time | 0.065 | 8 | 0.008 | 0.001 | 1.000 |
| Time \* Compartment | 227.341 | 40 | 5.684 | 0.629 | 0.956 |
| Error (Time) | 1301.990 | 144 | 9.042 | - | - |

**Table S3c** Tests of between-subjects effects:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | Sum of squares | Degrees of freedom | Mean square | F | Significance (p) |
| Compartments | 122.056 | 5 | 24.411 | 2.181 | 0.102 |
| Error | 201.478 | 18 | 11.183 | - | - |

**Table S4a** Results of the mixed-design ANOVA for the distribution (%) of tadpole in the Dichlorvos test in the linear system. Observation times were treated as a within-subjects factor (repeated measures) and compartments were considered a between-subjects factor. Mauchly's Test was used to check the sphericity of the repeated measures.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Within subjects effect | Mauchly W | Approx. chi-square | Degrees of freedom | Significance (p) |
|  |
| Time | 0.023 | 56.994 | 35 | 0.014 |  |

**Table S4b** Greenhouse-Geisser tests of within-subjects effects:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | Sum of squares | Degrees of freedom | Mean square | F | Significance (p) |
| Time | 345.077 | 4.833 | 71.394 | 1.154 | 0.338 |
| Time \* Compartment | 6059.995 | 24.167 | 250.754 | 4.055 | 0.00 |
| Error (Time) | 5380.371 | 87.002 | 61.842 | - | - |

**Table S4c** Tests of between-subjects effects:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | Sum of squares | Degrees of freedom | Mean square | F | Significance (p) |
| Compartments | 38679.602 | 5 | 7735.920 | 86.583 | 0.00 |
| Error | 1608.238 | 18 | 89.347 | - | - |

**Table S5a** Results of the mixed-design ANOVA for the distribution (%) of tadpole in the Paraquat test in the linear system. Observation times were treated as a within-subjects factor (repeated measures) and compartments were considered a between-subjects factor. Mauchly's Test was used to check the sphericity of the repeated measures.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Within subjects effect | Mauchly W | Approx. chi-square | Degrees of freedom | Significance (p) |
|  |
| Time | 0.001 | 110.404 | 35 | 0.00 |  |

**Table S5b** Greenhouse-Geisser tests of within-subjects effects:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | Sum of squares | Degrees of freedom | Mean square | F | Significance (p) |
| Time | 239.210 | 2.659 | 89.950 | 0.720 | 0.529 |
| Time \* Compartment | 4540.848 | 13.297 | 341.498 | 2.734 | 0.005 |
| Error (Time) | 5979.180 | 18 | 332.177 | - | - |

**Table S5c** Tests of between-subjects effects:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | Sum of squares | Degrees of freedom | Mean square | F | Significance (p) |
| Compartments | 82852.685 | 5 | 16570.537 | 121.219 | 0.00 |
| Error | 2460.576 | 18 | 136.699 | - | - |