**APPENDIX 2-5. Atrazine Species Sensitivity Distribution Analysis for Aquatic Plants**

SSDs were fit to toxicity data for vascular, nonvascular, and all aquatic plants exposed to atrazine. Five distributions were tested and a variety of methods were used to determine whether different subsets of data should be modeled independently. Ultimately, the results from the all aquatic plant SSDs was used.  **Table 1** provides a summary of the results.

**Table 1. Summary statistics for SSDs fit to atrazine test results.**

|  |  |
| --- | --- |
| **Statistic** | **All Aquatic Plants** |
| Best Distribution (by AICc) | Gumbel |
| Goodness of fit P-value | 0.13 |
| CV of the HC05 | 0.49 |
| HC05 | 14.4 |
| HC10 | 22.4 |
| HC50 | 164 |
| HC90 | 3758 |
| HC95 | 12427 |

1. Data

Data used in this analysis are detailed in **Table 12** (at the end of the document) and were from registrant submitted studies as well as an ECOTOX query (**APPENDIX 2-2**). **Table 2** provides the distribution of the test results for atrazine including the number of species represented. Distributions were created for vascular aquatic plants based on EC50 values for various metrics of growth from 7-d studies, nonvascular aquatic plants based on EC50 values for various metrics of growth from 72- and 96-h studies, and all aquatic plants (combines vascular and aquatic vascular plant datasets)

**Table 2. Distribution of test results available for atrazine.**

|  |  |  |
| --- | --- | --- |
| **Data Subset** | **Test results** | **Species** |
| All Aquatic Plants | 184 | 34 |
| Nonvascular Aquatic Plants | 114 | 25 |
| Vascular Aquatic Plants | 70 | 9 |

**Figure 1** shows the distribution of test results among species, indicating that several species have been repeatedly tested (seven species have been tested at least 5 times each), but the majority of species have been tested fewer than three times, with 11 species having only one test result.

 

**Figure 1. Distribution of the number of test results per species in atrazine aquatic plant data.**

Five potential distributions for the atrazine data were considered, including log-normal, log-logistic, log-triangular, log-gumbel, and Burr. To fit each of the first four distributions, the toxicity values were first common log (log10) transformed. Finally, effect thresholds and five quantiles from the fitted SSDs (HC05, HC10, HC50, HC90, HC95) were calculated and reported.

1. Comparison of distributions using AICc

Akaike’s Information Criterion corrected for sample size (AICc) was used to compare the five distributions for the aquatic plant dataset. For these comparisons all SSDs were fit using maximum likelihood. The AICc suggested that the gumbel distribution provided the best fit for the all aquatic plant and nonvascular aquatic plant distributions (**Tables 3 and 4**) while the triangular distribution provided the best fit for the vascular aquatic plant distribution (**Table 5**).

**Table 3. Comparison of distributions for all aquatic aquatic plant toxicity data for atrazine.**

| **Distribution** | **AICc** | **∆AICc** | **Weight** | **HC05** |
| --- | --- | --- | --- | --- |
| gumbel | 480.4234 | 0 | 0.7678 | 20.0419 |
| burr | 482.9008 | 2.4774 | 0.2225 | 20.0917 |
| logistic | 490.2380 | 9.8146 | 0.0057 | 6.0419 |
| normal | 491.5476 | 11.1242 | 0.0029 | 7.4044 |
| triangular | 493.4478 | 13.0244 | 0.0011 | 7.3865 |

**Table 4. Comparison of distributions for all nonvascular aquatic aquatic plant toxicity data for atrazine.**

| **Distribution** | **AICc** | **∆AICc** | **Weight** | **HC05** |
| --- | --- | --- | --- | --- |
| gumbel | 330.6417 | 0 | 0.7650 | 19.6959 |
| burr | 333.2447 | 2.6030 | 0.2082 | 19.6877 |
| logistic | 337.4789 | 6.8372 | 0.0251 | 8.8743 |
| normal | 342.8469 | 12.2052 | 0.0017 | 7.7745 |
| triangular | 352.4765 | 21.8348 | 1.3878e-05 | 3.6661 |

**Table 5. Comparison of distributions for all vascular aquatic aquatic plant toxicity data for atrazine.**

| **Distribution** | **AICc** | **∆AICc** | **Weight** | **HC05** |
| --- | --- | --- | --- | --- |
| triangular | 169.4126 | 0 | 0.3244 | 38.3812 |
| gumbel | 169.6605 | 0.2480 | 0.2866 | 41.6812 |
| normal | 170.0711 | 0.6585 | 0.2334 | 23.3218 |
| logistic | 171.2483 | 1.8357 | 0.1296 | 13.2127 |
| burr | 174.4628 | 5.0502 | 0.0260 | 41.6383 |

1. Goodness of fit

The plot of the cumulative distribution functions for the best-fit distributions (as determined by AICc) suggest little evidence of lack-of-fit (**Figure 2**). Bootstrap goodness-of-fit tests did not show evidence for lack-of-fit (P-values > 0.05, **Tablea 6-8**) for the log-gumbel or burr distributions, but the rest of the distributions showed significant lack-of-fit. The coefficient of variation for the HC05 was below 1 for all distributions.



**Figure 2. Log-gumbel SSD for atrazine toxicity values for all aquatic aquatic plants.** Black points indicate single toxicity values. Red points indicate average of multiple toxicity values for a single species. Blue line indicates full range of toxicity values for a given taxon.



**Figure 3. Log-gumbel SSD for atrazine toxicity values for nonvascular aquatic aquatic plants.** Black points indicate single toxicity values. Red points indicate average of multiple toxicity values for a single species. Blue line indicates full range of toxicity values for a given taxon.



**Figure 4. Log-triangular SSD for atrazine toxicity values for vascular aquatic aquatic plants.** Black points indicate single toxicity values. Red points indicate average of multiple toxicity values for a single species. Blue line indicates full range of toxicity values for a given taxon.

**Table 6. Range of HC05 values for atrazine SSDs for all aquatic plants.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Distribution** | **Method** | **HC05** | **SE** | **CV** | **Lower CI** | **Upper CI** | **P** |
| Normal | ML | 7.4044 | 5.6891 | 0.7683 | 2.4671 | 22.9197 | 9.99E-04 |
| Normal | MO | 7.0068 | 5.4131 | 0.7725 | 2.2855 | 21.6351 | 9.99E-04 |
| Normal | GR | 6.8384 | 4.5022 | 0.6584 | 1.7135 | 18.8413 | 9.99E-04 |
| Logistic | ML | 6.0419 | 4.9865 | 0.8253 | 1.8505 | 20.9251 | 0.004 |
| Logistic | MO | 7.3352 | 6.4121 | 0.8742 | 1.9151 | 25.4161 | 0.002 |
| Logistic | GR | 6.1374 | 4.2552 | 0.6933 | 0.8192 | 17.7206 | 9.99E-04 |
| Triangular | ML | 7.3865 | 5.9887 | 0.8108 | 4.0037 | 23.6793 | 9.99E-04 |
| Triangular | MO | 6.5723 | 4.8055 | 0.7312 | 2.4017 | 20.8212 | 0.002 |
| Triangular | GR | 7.2705 | 4.2744 | 0.5879 | 2.3525 | 17.5419 | 9.99E-04 |
| Gumbel | ML | 20.0419 | 6.4553 | 0.3221 | 12.2932 | 36.5103 | 0.0569 |
| Gumbel | MO | 14.4391 | 7.0343 | 0.4872 | 6.541 | 34.5555 | 0.1279 |
| Gumbel | GR | 11.7671 | 5.1221 | 0.4353 | 3.7893 | 22.8014 | 0.0679 |
| Burr | ML | 20.0917 | 6.9484 | 0.3458 | 11.5836 | 38.1623 | 0.039 |

ML=maximum likelihood, MO= moment estimators, and GR=graphical methods

LCp and UCp=projections of the confidence limits of the HC05 (LCx and UCx) onto the cumulative distribution function of the fitted distribution.

**Table 7. Range of HC05 values for atrazine SSDs for nonvascular aquatic plants.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Distribution** | **Method** | **HC05** | **SE** | **CV** | **Lower CI** | **Upper CI** | **P** |
| Normal | ML | 7.7745 | 5.5559 | 0.7146 | 3.0858 | 23.9168 | 0.004 |
| Normal | MO | 7.3423 | 4.7057 | 0.6409 | 2.5577 | 19.6013 | 0.005 |
| Normal | GR | 7.9242 | 4.4241 | 0.5583 | 2.1961 | 18.8993 | 0.002 |
| Logistic | ML | 8.8743 | 5.293 | 0.5964 | 3.3001 | 23.6413 | 0.0869 |
| Logistic | MO | 7.6191 | 5.7507 | 0.7548 | 2.4854 | 24.5299 | 0.006 |
| Logistic | GR | 6.9929 | 4.3315 | 0.6194 | 1.1679 | 17.0585 | 0.006 |
| Triangular | ML | 3.6661 | 4.3728 | 1.1928 | 1.611 | 17.9519 | 9.99E-04 |
| Triangular | MO | 6.9724 | 4.509 | 0.6467 | 2.7761 | 20.0757 | 9.99E-04 |
| Triangular | GR | 8.547 | 4.2515 | 0.4974 | 3.1794 | 19.3244 | 9.99E-04 |
| Gumbel | ML | 19.6959 | 5.3197 | 0.2701 | 13.0717 | 33.6413 | 0.4116 |
| Gumbel | MO | 13.1663 | 6.1812 | 0.4695 | 6.2876 | 30.0679 | 0.2877 |
| Gumbel | GR | 11.6856 | 4.5667 | 0.3908 | 4.1128 | 21.822 | 0.1069 |
| Burr | ML | 19.6877 | 5.8227 | 0.2958 | 12.4171 | 34.4647 | 0.3077 |

ML=maximum likelihood, MO= moment estimators, and GR=graphical methods

LCp and UCp=projections of the confidence limits of the HC05 (LCx and UCx) onto the cumulative distribution function of the fitted distribution.

**Table 8. Range of HC05 values for atrazine SSDs for vascular aquatic plants.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Distribution** | **Method** | **HC05** | **SE** | **CV** | **Lower CI** | **Upper CI** | **P** |
| Normal | ML | 23.3218 | 89.3204 | 3.8299 | 3.4052 | 253.5225 | 0.0549 |
| Normal | MO | 18.6011 | 72.7744 | 3.9124 | 1.7324 | 249.429 | 0.0639 |
| Normal | GR | 9.7597 | 43.2731 | 4.4338 | 0.1635 | 100.7301 | 0.1499 |
| Logistic | ML | 13.2127 | 66.8711 | 5.0611 | 0.7982 | 237.6368 | 0.029 |
| Logistic | MO | 19.5879 | 76.849 | 3.9233 | 1.2445 | 248.0522 | 0.05 |
| Logistic | GR | 7.5255 | 35.9831 | 4.7815 | 0.0338 | 91.4558 | 0.1658 |
| Triangular | ML | 38.3812 | 106.927 | 2.7859 | 13.9492 | 391.5553 | 0.036 |
| Triangular | MO | 17.3051 | 88.3969 | 5.1081 | 2.3622 | 212.243 | 0.0939 |
| Triangular | GR | 11.6941 | 41.5683 | 3.5546 | 0.4894 | 135.1144 | 0.1688 |
| Gumbel | ML | 41.6812 | 63.2857 | 1.5183 | 13.6456 | 237.1448 | 0.0809 |
| Gumbel | MO | 42.0573 | 68.9389 | 1.6392 | 7.8328 | 254.2242 | 0.1189 |
| Gumbel | GR | 24.3877 | 55.9558 | 2.2944 | 1.1712 | 216.0552 | 0.2527 |
| Burr | ML | 41.6383 | 60.882 | 1.4622 | 13.0192 | 241.1582 | 0.0539 |

ML=maximum likelihood, MO= moment estimators, and GR=graphical methods

LCp and UCp=projections of the confidence limits of the HC05 (LCx and UCx) onto the cumulative distribution function of the fitted distribution.

1. Test for the need to model results separately by vascular and nonvascular aquatic plants

Examination of the cumulative distribution functions plotted on similar axes for vascular aquatic plants and nonvascular aquatic plants does not support combining the datasets into one distribution. The 95% bootstrap confidence intervals for the separate distributions do not overlap substantially (**Figure 5**). While the HC05 values for each distribution were simlar, there is on order of magnitude difference in the HC50 values and more than an order of magnitude difference in the HC90 values. Given these differences, the vascular and nonvascular aquatic plant distributions will be used separately.

The combined SSD better represents the prey/habitat of a listed species. The HC05 generated using this distribution has a tighter confidence interval. This value is also lower (i.e., more conservative) than the vascular plant value, which is uncertain due to the limited number of species. The value is also very similar to the non-vascular plant HC05, so, the inclusion of the vascular plant endpoints s is not having a large impact on the HC05.

**Figure 5. SSDs for nonvascular aquatic plant EC50s (gumbel), and vascular aquatic plant EC50s (gumbel) for atrazine**. Blue lines show the distribution and upper and lower confidence interval for nonvascular aquatic plants. Red lines show the distribution and upper and lower confidence interval for vascular aquatic plants. Black lines show the distribution and upper and lower confidence interval for all aquatic plants.

1. Calculation of other quantiles

**Tables 9 - 11** provides estimates of the HC05 as well as other quantiles of the fitted SSDs.

**Table 9. Estimated quantiles of the fitted SSDs for atrazine EC50s for all aquatic plants.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Distribution** | **Method** | **HC05** | **HC10** | **HC50** | **HC90** | **HC95** |
| Normal | ML | 7.4044 | 15.8638 | 233.1926 | 3.43E+03 | 7.34E+03 |
| Normal | MO | 7.0068 | 15.196 | 233.1926 | 3.58E+03 | 7.76E+03 |
| Normal | GR | 6.8384 | 14.9107 | 233.1926 | 3.65E+03 | 7.95E+03 |
| Logistic | ML | 6.0419 | 14.0291 | 167.0526 | 1.99E+03 | 4.62E+03 |
| Logistic | MO | 7.3352 | 17.6463 | 233.1926 | 3.08E+03 | 7.41E+03 |
| Logistic | GR | 6.1374 | 15.4481 | 233.1926 | 3.52E+03 | 8.86E+03 |
| Triangular | ML | 7.3865 | 15.3528 | 336.6274 | 7.38E+03 | 1.53E+04 |
| Triangular | MO | 6.5723 | 13.0209 | 233.1926 | 4.18E+03 | 8.27E+03 |
| Triangular | GR | 7.2705 | 14.1283 | 233.1926 | 3.85E+03 | 7.48E+03 |
| Gumbel | ML | 20.0419 | 29.0615 | 158.3221 | 2.26E+03 | 6.26E+03 |
| Gumbel | MO | 14.4391 | 22.3574 | 164.3165 | 3.76E+03 | 1.24E+04 |
| Gumbel | GR | 11.7671 | 19.0287 | 170.4893 | 5.32E+03 | 1.98E+04 |
| Burr | ML | 20.0917 | 29.1282 | 157.9638 | 2.23E+03 | 6.14E+03 |

**Table 10. Estimated quantiles of the fitted SSDs for atrazine EC50s for nonvascular aquatic plants.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Distribution** | **Method** | **HC05** | **HC10** | **HC50** | **HC90** | **HC95** |
| Normal | ML | 7.7745 | 14.3462 | 124.5314 | 1.08E+03 | 1.99E+03 |
| Normal | MO | 7.3423 | 13.721 | 124.5314 | 1.13E+03 | 2.11E+03 |
| Normal | GR | 7.9242 | 14.5609 | 124.5314 | 1.07E+03 | 1.96E+03 |
| Logistic | ML | 8.8743 | 16.2532 | 96.3221 | 5.71E+02 | 1.05E+03 |
| Logistic | MO | 7.6191 | 15.4819 | 124.5314 | 1.00E+03 | 2.04E+03 |
| Logistic | GR | 6.9929 | 14.5221 | 124.5314 | 1.07E+03 | 2.22E+03 |
| Triangular | ML | 3.6661 | 8.0094 | 216.7265 | 5.86E+03 | 1.28E+04 |
| Triangular | MO | 6.9724 | 12.1115 | 124.5314 | 1.28E+03 | 2.22E+03 |
| Triangular | GR | 8.547 | 14.2788 | 124.5314 | 1.09E+03 | 1.81E+03 |
| Gumbel | ML | 19.6959 | 26.0672 | 93.6235 | 6.96E+02 | 1.50E+03 |
| Gumbel | MO | 13.1663 | 18.7425 | 93.8609 | 1.18E+03 | 3.09E+03 |
| Gumbel | GR | 11.6856 | 17.1299 | 98.071 | 1.52E+03 | 4.32E+03 |
| Burr | ML | 19.6877 | 26.0626 | 93.633 | 6.96E+02 | 1.50E+03 |

**Table 11. Estimated quantiles of the fitted SSDs for atrazine EC50s for vascular aquatic plants.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Distribution** | **Method** | **HC05** | **HC10** | **HC50** | **HC90** | **HC95** |
| Normal | ML | 23.3218 | 53.1378 | 970.482 | 1.77E+04 | 4.04E+04 |
| Normal | MO | 18.6011 | 44.5528 | 970.482 | 2.11E+04 | 5.06E+04 |
| Normal | GR | 9.7597 | 26.955 | 970.482 | 3.49E+04 | 9.65E+04 |
| Logistic | ML | 13.2127 | 38.5515 | 898.5604 | 2.09E+04 | 6.11E+04 |
| Logistic | MO | 19.5879 | 52.7388 | 970.482 | 1.79E+04 | 4.81E+04 |
| Logistic | GR | 7.5255 | 25.8291 | 970.482 | 3.65E+04 | 1.25E+05 |
| Triangular | ML | 38.3812 | 70.9797 | 950.588 | 1.27E+04 | 2.35E+04 |
| Triangular | MO | 17.3051 | 37.4268 | 970.482 | 2.52E+04 | 5.44E+04 |
| Triangular | GR | 11.6941 | 27.2635 | 970.482 | 3.45E+04 | 8.05E+04 |
| Gumbel | ML | 41.6812 | 68.0619 | 637.4794 | 2.13E+04 | 8.16E+04 |
| Gumbel | MO | 42.0573 | 68.8777 | 653.8116 | 2.23E+04 | 8.61E+04 |
| Gumbel | GR | 24.3877 | 44.9154 | 728.4134 | 5.77E+04 | 3.07E+05 |
| Burr | ML | 41.6383 | 68.0261 | 637.6894 | 2.13E+04 | 8.15E+04 |

**Table 12** provides all of the available EC50 values for aquatic plants from 72 to 96-h studies for nonvascular plants and from 7-d studies for vascular plants. These data sets are the same as reported in the effects characterization and provide additional data for the formulated products. Values that were included in the SSD (*i.e.,* TGAI) are marked with an \*.

**Table 12. Available effective concentration (EC50) data for aquatic plants exposed to atrazine used to contruct the SSD.**

|  |  |  |
| --- | --- | --- |
| **Genus** | **Species** | **EC50ug/L** |
| Acorus | americanus | 24300 |
| Ankistrodesmus | sp. | 32.36 |
| Ankistrodesmus | sp. | 32.5 |
| Ankistrodesmus | sp. | 55.7 |
| Chlamydomonas | reinhardtii | 29.32 |
| Chlamydomonas | reinhardtii | 49.82208 |
| Chlamydomonas | reinhardtii | 51 |
| Chlamydomonas | reinhardtii | 56.0768 |
| Chlamydomonas | geitleri | 200.5824 |
| Chlamydomonas | geitleri | 265.2864 |
| Chlamydomonas | geitleri | 280.384 |
| Chlamydomonas | geitleri | 301.952 |
| Chlamydomonas | geitleri | 308.4224 |
| Chlamydomonas | geitleri | 310.5792 |
| Chlamydomonas | geitleri | 317.0496 |
| Chlamydomonas | geitleri | 321.3632 |
| Chlamydomonas | reinhardtii | 350 |
| Chlamydomonas | geitleri | 373.1264 |
| Chlamydomonas | geitleri | 401.1648 |
| Chlamydomonas | geitleri | 532.7296 |
| Chlamydomonas | geitleri | 603.904 |
| Chlorella | vulgaris | 4.3 |
| Chlorella | vulgaris | 4.3 |
| Chlorella | pyrenoidosa | 52.44 |
| Chlorella | pyrenoidosa | 55.1 |
| Chlorella | pyrenoidosa | 60 |
| Chlorella | fusca | 66 |
| Chlorella | fusca | 68.2 |
| Chlorella | fusca | 76.9 |
| Chlorella | vulgaris | 157.016 |
| Chlorella | vulgaris | 172 |
| Chlorella | vulgaris | 409.792 |
| Chlorella | saccharophila | 780 |
| Chlorella | saccharophila | 1300 |
| Desmodesmus | subspicatus | 41 |
| Desmodesmus | subspicatus | 192 |
| Dunaliella | tertiolecta | 66.35 |
| Dunaliella | tertiolecta | 68.66 |
| Dunaliella | tertiolecta | 69 |
| Dunaliella | tertiolecta | 69.4 |
| Dunaliella | tertiolecta | 69.44 |
| Dunaliella | tertiolecta | 69.44 |
| Euglena | gracilis | 45000 |
| Euglena | gracilis | 84000 |
| Lemna | gibba | 32.1 |
| Lemna | minor | 39.9 |
| Lemna | minor | 42.3 |
| Lemna | sp. | 46 |
| Lemna | gibba | 46.5 |
| Lemna | gibba | 57 |
| Lemna | gibba | 60 |
| Lemna | minor | 61 |
| Lemna | minor | 61.71 |
| Lemna | sp. | 62 |
| Lemna | gibba | 64.2 |
| Lemna | gibba | 64.3 |
| Lemna | gibba | 65 |
| Lemna | minor | 66.8 |
| Lemna | sp. | 67 |
| Lemna | minor | 73.5 |
| Lemna | minor | 79.9 |
| Lemna | minor | 84.5 |
| Lemna | minor | 86.3 |
| Lemna | gibba | 89 |
| Lemna | gibba | 93 |
| Lemna | gibba | 94 |
| Lemna | minor | 100 |
| Lemna | gibba | 100 |
| Lemna | minor | 100.9 |
| Lemna | minor | 105.08 |
| Lemna | minor | 109.1 |
| Lemna | minor | 114 |
| Lemna | gibba | 120 |
| Lemna | minor | 121.85 |
| Lemna | gibba | 124 |
| Lemna | minor | 125 |
| Lemna | minor | 125.23 |
| Lemna | gibba | 128.4 |
| Lemna | minor | 133.6 |
| Lemna | gibba | 146.1 |
| Lemna | minor | 146.9 |
| Lemna | minor | 160.5 |
| Lemna | minor | 180 |
| Lemna | gibba | 187.9 |
| Lemna | minor | 188.75 |
| Lemna | minor | 197.42 |
| Lemna | aequinoctialis | 200.3667 |
| Lemna | minor | 215 |
| Lemna | minor | 215 |
| Lemna | minor | 215.45 |
| Lemna | minor | 218.2 |
| Lemna | minor | 252 |
| Lemna | gibba | 292.2 |
| Lemna | minor | 321 |
| Lemna | perpusilla | 13487 |
| Myriophyllum | aquaticum | 142.2 |
| Myriophyllum | aquaticum | 154.5 |
| Myriophyllum | aquaticum | 170 |
| Myriophyllum | aquaticum | 261 |
| Myriophyllum | aquaticum | 294 |
| Myriophyllum | aquaticum | 317 |
| Myriophyllum | aquaticum | 438.9 |
| Myriophyllum | aquaticum | 442 |
| Myriophyllum | aquaticum | 458.8 |
| Myriophyllum | aquaticum | 499 |
| Myriophyllum | aquaticum | 606 |
| Myriophyllum | aquaticum | 645.3 |
| Myriophyllum | aquaticum | 680.6 |
| Myriophyllum | aquaticum | 714.7 |
| Myriophyllum | aquaticum | 857.9 |
| Myriophyllum | aquaticum | 965.1 |
| Nephroselmis | pyriformis | 34.5088 |
| Nephroselmis | pyriformis | 49.6064 |
| Oophila | sp. | 95 |
| Oophila | sp. | 171 |
| Oophila | sp. | 172 |
| Oophila | sp. | 175 |
| Oophila | sp. | 200 |
| Oophila | sp. | 230 |
| Oophila | sp. | 284 |
| Oophila | sp. | 304 |
| Oophila | sp. | 309 |
| Oophila | sp. | 381 |
| Parachlorella | kessleri | 693.12 |
| Pavlova | sp. | 96 |
| Pavlova | sp. | 147 |
| Pavlova | sp. | 157.8578 |
| Porphyridium | aerugineum | 215.68 |
| Pseudokirchneriella | subcapitata | 26 |
| Pseudokirchneriella | subcapitata | 26 |
| Pseudokirchneriella | subcapitata | 41.16 |
| Pseudokirchneriella | subcapitata | 41.8 |
| Pseudokirchneriella | subcapitata | 48.77 |
| Pseudokirchneriella | subcapitata | 50 |
| Pseudokirchneriella | subcapitata | 63.4 |
| Pseudokirchneriella | subcapitata | 65 |
| Pseudokirchneriella | subcapitata | 76.4 |
| Pseudokirchneriella | subcapitata | 81.4 |
| Pseudokirchneriella | subcapitata | 86.1 |
| Pseudokirchneriella | subcapitata | 87.6 |
| Pseudokirchneriella | subcapitata | 89.9 |
| Pseudokirchneriella | subcapitata | 92.9 |
| Pseudokirchneriella | subcapitata | 94.9 |
| Pseudokirchneriella | subcapitata | 103 |
| Pseudokirchneriella | subcapitata | 107 |
| Pseudokirchneriella | subcapitata | 115 |
| Pseudokirchneriella | subcapitata | 118 |
| Pseudokirchneriella | subcapitata | 126 |
| Pseudokirchneriella | subcapitata | 130 |
| Pseudokirchneriella | subcapitata | 138 |
| Pseudokirchneriella | subcapitata | 158 |
| Pseudokirchneriella | subcapitata | 159 |
| Pseudokirchneriella | subcapitata | 164 |
| Pseudokirchneriella | subcapitata | 164.3 |
| Pseudokirchneriella | subcapitata | 191 |
| Pseudokirchneriella | subcapitata | 196 |
| Pseudokirchneriella | subcapitata | 200 |
| Pseudokirchneriella | subcapitata | 200 |
| Pseudokirchneriella | subcapitata | 220 |
| Pseudokirchneriella | subcapitata | 277 |
| Pseudokirchneriella | subcapitata | 300 |
| Pseudokirchneriella | subcapitata | 1600 |
| Rhodomonas | salina | 165 |
| Scenedesmus | acutus | 11 |
| Scenedesmus | acutus | 14 |
| Scenedesmus | quadricauda | 15.58 |
| Scenedesmus | quadricauda | 16.96 |
| Scenedesmus | subspicatus | 21 |
| Scenedesmus | subspicatus | 36.72 |
| Scenedesmus | acutus | 45 |
| Scenedesmus | acutus | 47.006 |
| Scenedesmus | acutus | 56 |
| Scenedesmus | subspicatus | 72 |
| Scenedesmus | acutus | 86 |
| Scenedesmus | acutus | 97.91872 |
| Scenedesmus | subspicatus | 99.2 |
| Stichococcus | bacillaris | 1347.16 |
| Storeatula | major | 22.17 |
| Storeatula | major | 48.45 |
| Storeatula | major | 49.16 |
| Storeatula | major | 89.97 |
| Tetraselmis | chuii | 20 |
| Typha | angustifolia | 5240 |
| Typha | latifolia | 8760 |