

環境庁殿

最 終 報 告 書

ジクロロブロモメタンのオオミジンコ(*Daphnia magna*)に対する繁殖阻害試験

(試験番号：91508)

1996 年 4 月 30 日作成

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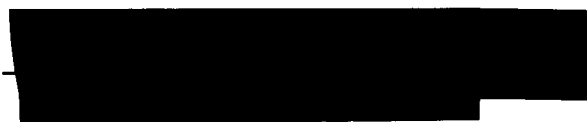
表 題： ジクロロプロモメタンのオオミジンコ(*Daphnia magna*)に対する
繁殖阻害試験

試験番号： 91508

上記試験は契約書別添2「生態影響試験実施に関する基準」(平成7年9月26日)に準拠
したものである。

1996年 4月 30日

運営管理者



信頼性保証書

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本試験は試験計画書及び標準操作手順書に従って実施され、本報告書には試験に使用した方法、手順が正確に記載されており、試験結果は生データを正確に反映していることを下記の通り確認した。

| 監査又は査察内容 | 実施日 | 報告日 (運営管理者) | 報告日 (試験責任者) |
|------------|--------------|--------------|--------------|
| 試験計画書監査 | 1996年 2月 7日 | 1996年 2月 7日 | 1996年 2月 7日 |
| 試験計画書の変更監査 | 1996年 3月 29日 | 1996年 3月 29日 | 1996年 3月 29日 |
| 試験実施状況査察 | 1996年 4月 3日 | 1996年 4月 8日 | 1996年 4月 8日 |
| 試験実施状況査察 | 1996年 4月 15日 | 1996年 4月 23日 | 1996年 4月 23日 |
| 試験実施状況査察 | 1996年 4月 19日 | 1996年 4月 23日 | 1996年 4月 23日 |
| 最終報告書監査 | 1996年 4月 30日 | 1996年 4月 30日 | 1996年 4月 30日 |

1996年 4月 30日

信頼性保証部門責任者：



試験実施概要

1. 表 題

ジクロロブロモメタンのオオミジンコ(*Daphnia magna*)に対する繁殖阻害試験

2. 試験目的

ジクロロブロモメタンについて、オオミジンコ(*Daphnia magna*)に対する繁殖阻害試験を21日間行い、繁殖状態に対照区と有意差の認められない最高濃度(NOECr)及び産仔数を50%減少させると算定される濃度(50%繁殖阻害濃度: ErC50)を求める。

3. 試験方法

本試験は、OECD 化学品テストガイドライン No.202「ミジンコ類、急性遊泳阻害試験及び繁殖試験」(1984年)に準拠した。

4. 適用GLP

本試験は契約書別添2「生態影響試験実施に関する基準」(平成7年9月26日)に準拠した。

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8. 試験関係者

試験責任者

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試験担当者

生物試験担当

[REDACTED]

分析担当

[REDACTED]

データ処理担当

[REDACTED]

試験資料管理部門責任者

[REDACTED]

9. 最終報告書の承認

1996 年 4 月 30 日

試験責任者

氏名

[REDACTED]

10. 試験期間

試験開始日

1996 年 2 月 7 日

試験終了日

1996 年 4 月 30 日

暴露期間

1996 年 3 月 31 日～1996 年 4 月 21 日

11. 保管

試験計画書、生データ、記録文書、最終報告書及び被験物質は、最終報告書作成後10年間、財団法人 化学品検査協会 化学品安全センター 久留米研究所の保管施設に保管する。その後の保管については試験委託者と協議のうえ決定する。

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要 旨

試験委託者

環境庁

表 題ジクロロブロモメタンのオオミジンコ(*Daphnia magna*)に対する繁殖阻害試験試験番号

91508

試験方法

本試験は、OECD 化学品テストガイドライン No.202「ミジンコ類、急性遊泳阻害試験及び繁殖試験」(1984年)に準拠して実施した。

- 1) 被験物質： ジクロロブロモメタン
- 2) 暴露方式： 半止水式(1日に1回、試験液の全量を交換)
- 3) 供試生物： オオミジンコ (*Daphnia magna*)
- 4) 暴露期間： 21日間
- 5) 連 数： 1試験区につき4連
- 6) 生 物 数： 40頭/1試験区(1連につき10頭で1試験区40頭)
- 7) 試験濃度： 25.0, 7.91, 2.50, 0.791, 0.250, 0.0791, 0.0250 mg/L
(濃度公比： $\sqrt{10}$)及び対照区
- 8) 試験液量： 約1.25 L/容器×4容器/1試験区
- 9) 照 明： 16時間明/8時間暗
- 10) 水 温： $20 \pm 1^{\circ}\text{C}$
- 11) 試験液中の被験物質の分析： ヘッドスペースガスクロマトグラフィー(HS-GC)
(0, 1, 8, 9, 15及び16日目)

結 果

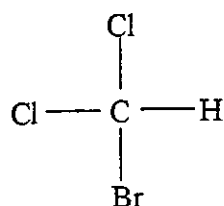
- 1) 21日間の親ミジンコの50%致死濃度(LC50)
= 6.11 mg/L(95%信頼区間：4.57 ~ 8.47 mg/L)
- 2) 21日間の50%繁殖阻害濃度(ErC50)
= 1.90 mg/L(95%信頼区間：1.55 ~ 2.35 mg/L)
- 3) 最大無作用濃度(NOECr) = 0.791 mg/L
- 4) 最小作用濃度 (LOECr) = 2.50 mg/L
(上記濃度は、全て設定値に基づく値)

1. 被驗物質

本報告書においてジクロロプロモメタンは、次の名称及び品質等を有するものとする。被験物質に関する情報については供給者提供の添付資料等によった。

1.1 名称、構造式及び物理化学的性状

- 1) 名 称: ジクロロブロモメタン
(CAS番号 75-27-4)
- 2) 構 造 式:



- 3) 分子式: CHBrCl₂
4) 分子量: 163.83 #2
5) 比重: 1.9836 (20℃/20℃) #1
6) 外観: 無色透明液体 #1
7) 安定性: 不明
8) 1-オクタノール/水分配係数(logP): 1.88 #2
9) pKa: 不明
10) 水への溶解度: 不溶 #2
11) 蒸気圧: 50 mgHg(20℃) #2
12) 純度及び不純物: 含量(ガスクロマトグラフ法) 96.5% #1
不純物 エタノール 0.7% #1
13) ロット番号: FLB01
14) 供給者: XXXXXXXXXX
15) 供給量: 125 g(25 g×5本)
16) 入手日: 1995年12月1日

情報源

- #1: 供給者提供の添付資料
#2: 環境庁環境化学物質研究会編「環境化学物質要覧」(丸善)1988.

1.2 被験物質の確認及び保管条件下での安定性

被験物質は当研究所の冷蔵庫に保管した。

入手した被験物質について赤外吸収スペクトルを測定し、被験物質の特性と矛盾が認められないことを確認した。暴露終了後にも同様にスペクトルを測定し、暴露開始前に測定したスペクトルと比較した結果、スペクトルに変化は無かったことより被験物質は当研究所の冷蔵庫に保管中は安定であったと判断された。

2. 供試生物

試験には生後24時間令以内のオオミジンコ(*Daphnia magna*)の幼体を用いた。

本種は、U.S. EPA Environmental Research Laboratory, Duluthより入手したものを、当研究所において継代飼育しているものである。また、基準物質(重クロム酸カリウム、試薬特級)の48時間 EC_{50} は0.296 mg/Lであった。

供試する幼体を得るためのミジンコの飼育方法

継代飼育している2～4週令のミジンコを供試ミジンコの親とした。成熟し幼体を生むようになったら少なくとも、試験前日には幼体を除去した。ただし、死亡個体の多いバッチ、休眠卵や雄が生じたバッチのミジンコは使用しなかった。

- 1) 飼育水： 希釈水 (3.2 参照)
- 2) 飼育密度： 10 頭／0.8 L 飼育水
- 3) 水温： $20 \pm 1^{\circ}\text{C}$
- 4) 照明： 室内光、16 時間明／8 時間暗
- 5) 餌： 単細胞緑藻類(*Chlorella vulgaris*)
藻類培養液を遠心操作により、希釈水に置換して給餌した。
- 6) 給餌量： ミジンコ 1 頭当たり *Chlorella vulgaris* を 0.1～0.2 mgC(有機炭素含量)／日の割合で与えた。この範囲でミジンコの成育段階に応じて段階的に餌の量を変えて与えた。

3. 試験方法

3.1 試験条件

- 1) 暴露方式： 被験物質を含む試験液へ試験生物を暴露する薬浴方式を用いた。試験は密閉で行い、1日に1回試験液を全量交換する半止水式で行った。
- 2) 暴露期間： 21日間
- 3) 連 数： 1試験区につき4連
- 4) 生物数： 40頭／1試験区(1連につき10頭で1試験区40頭)
- 5) 試験液量： 約1.25 L／容器×4容器／1試験区
- 6) 水 温： $20 \pm 1^{\circ}\text{C}$
- 7) 照 明： 室内光、16時間明／8時間暗
- 8) 給 餌 量： ミジンコ1頭当たり *Chlorella vulgaris* を0.1～0.2 mgC(有機炭素含量)／日の割合で与えた。

3.2 希釈水

脱塩素水道水(久留米市水道水を活性炭処理し、残留塩素等を除去したもので、充分通気した)を使用した。希釈水の主な水質として、硬度は 35.5 mg/L(CaCO_3 換算)、pH は 6.9 であった。希釈水使用時にはオルトトリジン法によって残留塩素濃度が 0.02 mg/L 以下であることを確認した。

[付属資料－1]

3.3 試験容器及び恒温槽等

- 1) 試験容器： 1 L容のガラス容器(直径 11 cm、深さ 13 cm)に時計皿を用いて密閉容器とした。
- 2) 恒 温 槽： 加温冷却機によって試験容器内の水温を $20 \pm 1^{\circ}\text{C}$ に維持する恒温槽を用いた。
- 3) 水 温 計： 検定済ガラス製棒状温度計
- 4) pH 計： ガラス電極式水素イオン濃度計HM-14P型(東亜電波工業)
- 5) 溶存酸素計： 溶存酸素計58型(Yellow Springs Instrument Co., Inc.)

3.4 試験濃度の設定

急性遊泳障害試験の結果である 48-h EC_{50} 値(29.0 mg/L)及び 1 回行った繁殖試験の結果から、試験濃度は 25.0 mg/L を最高濃度として濃度公比 $\sqrt{10}$ で 7 濃度区(25.0, 7.91, 2.50, 0.791, 0.250, 0.0791 及び 0.0250 mg/L)を設定した。対照には希釈水のみに対照区を設けた。

3.5 試験液の調製

被験物質をピペットマンで希釈水に添加[添加量は比重(1.98)で調整]し、マグネチックスターラーを用いて攪拌して 500 mg/L の試験原液を調製した。この際、試験原液の濃度測定結果を基に、設定濃度になるように添加した。また、試験液の状態(外観等)を観察した。

3.6 試験液の分析

全試験区(ただし、4 試験容器の中層より等量を採取したものを混合した 1 試料/1 試験区)について、暴露期間中に 6 回(換水前後のものを 3 回繰り返し)の頻度で採取し、遠心分離して餌を除いた後、そのまま若しくは希釈して HS-GC により分析した。試験液の分析に際しては、試料測定毎に標準溶液(濃度 1.0 mg/L)の測定を行い、そのピーク面積比から定量した。詳細は付属資料-2 に示した。試験最低濃度の 0.0250 mg/L 区については検量線の範囲以下の濃度であったが、検出限界以上であったので参考までに測定値として示した。

3.7 試験操作

試験液の水溫、溶存酸素濃度(D.O.)、pH を測定後、供試ミジンコを投入し、その時点を暴露開始時とした。先端が比較的広口のガラスピペットを用いて供試ミジンコを投入した。その際、試験液量に対して、ピペット内の飼育水は全量で 1%以内を目安とした。その後、換水毎にミジンコを新しい試験液に移しかえ、21 日目まで飼育した。暴露期間中は毎日一定量の給餌を行った(3.1 参照)。

・ミジンコの観察：

(親ミジンコ) 毎日、生存数、遊泳阻害数、大きさと状態を対照区と比較して観察した。死亡した親ミジンコは計数後に取り除いた。

(産出幼体) 1 日に 1 回の頻度で、幼体の生死の数及び休眠卵の発生等について観察した。計数後の幼体は取り除いた。最初の幼体産出日を記録した。

・水溫、D.O.、pH の測定：

暴露期間中、全試験区(ただし、各 1 試験容器)の試験液について、換水前後に測定した。

3.8 数値の取扱い

数値の丸め方は、JIS Z 8202-1985 参考 3 規則 A によった。

4. 結果の算出

得られたデータを基に以下 3 項目の結果を算出した。結果の算出には、被験物質濃度の測定値が設定値の±20%以下であったので設定濃度を用いた。

4.1 親ミジンコの半数致死濃度(LC50)の算出

各濃度区での親ミジンコの死亡数と供試個体数(40 頭)を用いて、Moving average 法により 21 日間の半数致死濃度(LC50)及びその 95%信頼限界を算出した。1, 2, 4, 7 日目の LC50 は、試験最高濃度の 25.0 mg/L においても 50%以上の死亡率が得られなかったため、25.0 mg/L 以上として表した。

4.2 50%繁殖阻害濃度(ErC50)の算出

累積産仔数の算出

各試験容器の親 1 頭当たりの試験期間中の累積産仔数(TF)及び平均累積産仔数(\overline{TF})を以下の式より求めた。

$$TF = \sum_{n=1}^{ne} \frac{2 \times F_n}{P_{n-1} + P_n}$$

ここで、

n : 幼体観察回数

F_n : n 回目の幼体数(ただし、生存幼体)

P_n : 暴露開始後 n 回目の観察時の親の数

P_{n-1} : $n-1$ 回目の親の数

P_0 : 最初に幼体を観察した日の前日の親の数

ne : 最終観察回

(ただし、 $P_{n-1} + P_n$ が 0 の場合は、無視した。)

$$\overline{TF} = \frac{\sum_{n=1}^m TF_n}{m}$$

ここで、

TF_n : 各試験容器の累積産仔数

m : 濃度区当たりの系列数(試験容器数: 4)

ErC50 値の算出

Moving average 法により 50%繁殖阻害濃度(ErC50)を算出した。ただし、供試個体数に対照区の平均累積産仔数を、生存数に各濃度区での平均累積産仔数を適用して計算した。14 及び 21 日目の ErC50 値を算出し、それらの 95%信頼限界も示した。

4.3 最大無作用濃度(NOECr)及び最小作用濃度(LOECr)

4.2 に示したように各試験容器毎の親 1 頭当たりの累積産仔数を算出し、各濃度区と対照区との有意差の有無を一元配置分散分析及び Dunnett の多重比較法により求め、対照区と有意差の認められない最高濃度(最大無作用濃度: NOECr)及び有意差の認められる最低濃度(最小作用濃度: LOECr)を決定した。

5. 結果及び考察

5.1 試験成績の信頼性に影響を及ぼしたと思われる環境要因

該当する要因はなかった。

5.2 試験液中の被験物質濃度

試験液調製時の被験物質濃度の測定値（検量線範囲内で定量したもの）は 0.0727 ～ 24.6 mg/L(設定値 0.0791 ～ 25.0 mg/L)であり、それらの 1 日後(換水前)の測定値は 0.0701 ～ 22.8 mg/L であった。測定値の設定値に対する割合は、調製時で 89.2 ～ 100%、1 日後(換水前)で 78.3 ～ 96.7%であり、ほぼ設定どおりであった。

[Table 1 (p.11), 付属資料-2]

5.3 ミジンコの観察結果

親ミジンコの死亡数及び死亡率

対照区での親ミジンコの平均累積死亡率は暴露終了時で 2.5%であり、試験成立条件である 20%以下の基準を満たした。

0.0250 ~ 0.250 mg/L での平均累積死亡率は暴露終了時で 0~5%であり、対照区とほとんど変わらなかった。

0.791 ~ 7.91 mg/L での平均累積死亡率は暴露終了時で 17.5~35%であったが、統計的には対照区と有意差はみられなかった。0.791 mg/L の濃度区では 4 容器のうち 3 容器では全く死亡がみられなかったが、1 容器のみで 100%の死亡がみられた。しかし、この濃度よりも高い 2.50 mg/L の濃度ではこのような高い死亡率は観察できなかったことやミジンコでは対照区でも原因不明で死亡が高率にすることもあるため、この 1 容器での高死亡率は生物側の問題で生じたものではないかとも考えられる。また、2.50 mg/L の濃度区でも 4 容器のうち 3 容器では 0 又は 10%の死亡率であったが、1 容器のみで 50%の死亡率であった。この濃度の 1 容器での死亡も生物側の問題であるかもしれないと考えられる。

これらのことは、本報告書の試験とは別に行った繁殖試験（無作用濃度が算定できなかったので不採用とした試験）では 1.88~15.0 mg/L の濃度範囲で全く死亡がみられなかったことから裏付けることができる（追加資料-1）。

25.0 mg/L での累積死亡率は暴露 10 日間で 100%であり、生存に対して明らかな影響がみられた。

[$p=0.05$, 統計的方法：Kruskal-Wallis の順位和検定及び
ノンパラメトリックの多重比較法(Dunnett)]
[Table 2 (p.12), Figure 1 (p.20) 付属資料-3]

初産日

対照区での親ミジンコの初産日は 7 日であり、試験成立条件である 9 日以内の基準を満たした。

0.791 mg/L 以下の濃度区では初産日は 7 日であり、対照区と変わりなかった。

2.50 mg/L 区では、1 容器で 8 日の初産日であったが、その他の容器では 7 日であり、対照区と統計的に有意差はみられなかった。

7.91 mg/L 以上の濃度区では幼体の産出は全くみられなかった。

[$p=0.05$, 統計的方法：Kruskal-Wallis の順位和検定及び
ノンパラメトリックの多重比較法(Dunnett)]
[Table 3 (p.13), 付属資料-3]

平均累積産仔数

対照区での親ミジンコは 5 腹産出し、親ミジンコ 1 頭当たりの平均累積産仔数は 85 頭であり、試験成立条件である 3 腹以上、20 頭の基準を満たした。

0.0250 ～ 2.50 mg/L 区での平均累積産仔数は 65 ～ 88.1 頭であり、統計的に有意差はみられなかった。しかし、この濃度範囲で高濃度になるにつれて平均累積産仔数が少なくなる傾向がみられた。

7.91 mg/L 以上の濃度区では幼体の産出はみられなかった。

($p=0.05$, 統計的方法：一元配置分散分析及び Dunnett の多重比較法)
[Table 4 (p.14), Figure 2 (p.21) 付属資料-3]

親ミジンコの大きさと状態

2.50 mg/L 以下の濃度区では対照区と比較して親ミジンコの大きさや状態にほとんど相違はみられなかった。しかし、0.791 及び 2.50 mg/L の濃度区で死亡が発生した試験容器では主症状として体色の明化が観察された。

7.91 mg/L 区では暴露開始 6 日目より体の大きさが対照区より小さく、体色明化の症状が観察された。その後、活動度の低下も観察された。

25.0 mg/L 区では暴露開始 1 日目より活動度の低下がみられ、2 日目にはさらに体色明化も観察され、3 日目には体の大きさが対照区より小さく、その後活動度の低下や遊泳阻害等も観察された。

休眠卵の発生等

7.91 mg/L 区において 20 日目と 21 日目に各 1 個ずつ、休眠卵が観察された。
落下卵は全試験区で観察され、特に 7.91 mg/L 区でその数が多くみられた。

5.4 親ミジンコの 50%致死濃度(LC50)

21 日間の親ミジンコの 50%致死濃度(LC50)は 6.11 mg/L(設定濃度)であり、その 95%信頼区間は 4.57 ～ 8.47 mg/L であった。

[Table 5 (p.15)]

5.5 50%繁殖阻害濃度(ErC50)

14 日間の 50%繁殖阻害濃度(ErC50)は、1.34 mg/L(設定濃度)であり、その 95%信頼区間は 1.01～1.80 mg/L であった。また、21 日間の ErC50 は、1.90 mg/L (設定濃度)であり、その 95%信頼区間は 1.55 ～ 2.35 mg/L であった。

[Table 6 (p.15)]

5.6 累積産仔数に及ぼす最大無作用濃度(NOECr)及び最小作用濃度(LOECr)

0.791 mg/L 及び 2.50 mg/L の濃度区での平均累積産仔数はそれぞれ 71.8 及び 65 頭であり、対照群の 85 頭よりもやや少ないが、統計的には有意差はみられなかった。しかし、これらの濃度区では多少繁殖に影響している可能性もあると考えられる。0.791 mg/L の濃度区では 100%の死亡率であった 1 容器を除くと（生物側に問題があると仮定して）、親 1 頭当たりの平均累積産仔数は 84 頭であり、対照群とほとんど変わりがない。2.50 mg/L の濃度区では 50%の死亡率であった 1 容器を 0.791 mg/L 濃度区の場合と同様に除くと、平均累積産仔数は 75 頭であり、対照群より僅かに少ない程度である。本報告書の試験とは別に行った繁殖試験（無影響濃度が算定できなかったので不採用とした試験：追加資料-1）では 1.88 mg/L の濃度で 76 頭の平均累積産仔数（この時の対照区での平均累積産仔数は 102 頭）であり、統計的にも対照区と有意差がみられた。この試験の結果も考慮すると、2.50 mg/L の濃度ではミジンコの繁殖に影響があると判断するほうが妥当と考えられ、親ミジンコ 1 頭当たりの累積産仔数に及ぼす 21 日間の最大無作用濃度(NOECr)は 0.791 mg/L(設定濃度)であり、最小作用濃度(LOECr)は 2.50 mg/L(設定濃度)と評価した。

[Table 7 (p.16)]

5.7 試験液の水温、溶存酸素濃度及び pH

21 日間の暴露期間中の水温は 19.4 ～ 20.5℃であり、 $20 \pm 1^\circ\text{C}$ の範囲であった。溶存酸素濃度は 7.6 ～ 9.1 mg/L であり、すべての試験容器で飽和溶存酸素濃度の 60%以上であった(20.0℃の飽和溶存酸素濃度：8.84 mg/L)。pH は 7.17 ～ 7.86 であり、変動は 1 以下であった。

以上のことから、水温、溶存酸素濃度及び pH については、ミジンコの生育条件としては適切な範囲であったと思われる。

[Table 8, 9, 10 (p.17～19)]

5.8 試験液の状態

試験液調製時には無色透明であり、クロレラを給餌した後は淡緑色を呈していた。換水前ではその色が薄くなり、その程度はミジンコの数が多いときほど著しかった。

以 上

Table 1. Concentrations of dichlorobromomethane in reproduction test using *Daphnia magna* under semi-static conditions

| Nominal concentration (mg/L) | Observed concentration (mg/L) | | Geometric mean (mg/L) | Observed concentration (mg/L) | | Geometric mean (mg/L) |
|---------------------------------|----------------------------------|---------------------|--------------------------|----------------------------------|---------------------|--------------------------|
| | 0-day ^{a)} | 1-day ^{b)} | | 8-day ^{a)} | 9-day ^{b)} | |
| Control | 0 | 0 | - | 0 | 0 | - |
| 0.0250 | 0.0274 (110) | 0.0268 (107) | 0.0271 (108) | 0.0225 (90.2) | 0.0214 (85.7) | 0.0220 (88.0) |
| 0.0791 | 0.0768 (97.1) | 0.0706 (89.2) | 0.0737 (93.2) | 0.0727 (91.9) | 0.0701 (88.6) | 0.0714 (90.3) |
| 0.250 | 0.239 (95.6) | 0.229 (91.4) | 0.234 (93.6) | 0.244 (97.8) | 0.233 (93.4) | 0.239 (95.6) |
| 0.791 | 0.758 (95.9) | 0.620 (78.3) | 0.687 (86.9) | 0.775 (98.0) | 0.765 (96.7) | 0.770 (97.3) |
| 2.50 | 2.44 (97.7) | 2.39 (95.8) | 2.42 (96.8) | 2.46 (98.6) | 2.33 (93.1) | 2.40 (96.0) |
| 7.91 | 7.15 (90.4) | 7.51 (94.9) | 7.33 (92.7) | 7.06 (89.2) | 6.64 (83.9) | 6.85 (86.6) |
| 25.0 | 24.6 (98.4) | 22.8 (91.3) | 23.7 (94.8) | 22.4 (89.5) | 23.1 (92.4) | 22.7 (90.8) |

Table 1. (continued)

| Nominal concentration (mg/L) | Observed concentration (mg/L) | | Geometric mean (mg/L) | Time-weighted mean ^{c)} (mg/L) |
|---------------------------------|----------------------------------|----------------------|--------------------------|--|
| | 15-day ^{a)} | 16-day ^{b)} | | |
| Control | 0 | 0 | - | - |
| 0.0250 | 0.0257 (103) | 0.0243 (97.2) | 0.0250 (100) | 0.0244 (97.6) |
| 0.0791 | 0.0763 (96.5) | 0.0756 (95.5) | 0.0759 (96.0) | 0.0737 (93.2) |
| 0.250 | 0.241 (96.3) | 0.242 (96.9) | 0.242 (96.8) | 0.239 (95.6) |
| 0.791 | 0.793 (100) | 0.764 (96.6) | 0.778 (98.4) | 0.752 (95.1) |
| 2.50 | 2.45 (97.9) | 2.42 (96.7) | 2.43 (97.2) | 2.42 (96.8) |
| 7.91 | 7.32 (92.6) | 7.09 (89.6) | 7.20 (91.0) | 7.10 (89.8) |
| 25.0 | - (-) | - (-) | - (-) | 23.1 (92.4) |

The values in parentheses express percent of nominal.

a) fresh solutions

b) expired solutions

c) The values are expressed as time-weighted means calculated by the following equation:

$$((C_0 - C_1)/(\ln C_0 - \ln C_1) + (C_8 - C_9)/(\ln C_8 - \ln C_9) + (C_{15} - C_{16})/(\ln C_{15} - \ln C_{16}))/3$$

where

C_x : the observed concentration at x-day

$\ln C_x$: the natural logarithm of C_x

Table 2. Cumulative number of dead parental *Daphnia* during exposure to dichlorobromomethane

| Concentration (mg/L) | Exposure time (day) | | | | | | | | | | |
|-------------------------|---------------------|------------|------------|------------|------------|------------|------------|-------------|--------------|--------------|--------------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Control | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (2.5) | 1 (2.5) |
| 0.0250 | 40 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 0.0791 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 0.250 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 0.791 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 2.50 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) |
| 7.91 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 4 (10.0) | 7 (17.5) | 10 (25.0) |
| 25.0 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 2 (5.0) | 5 (12.5) | 16 (40.0) | 29 (72.5) | 40 (100) |

Table 2. (continued)

| Concentration (mg/L) | Exposure time (day) | | | | | | | | | | |
|-------------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| Control | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) |
| 0.0250 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 2 (5.0) | 2 (5.0) |
| 0.0791 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 0.250 | 0 (0) | 0 (0) | 0 (0) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 1 (2.5) | 2 (5.0) | 2 (5.0) | 2 (5.0) | 2 (5.0) |
| 0.791 | 1 (2.5) | 2 (5.0) | 2 (5.0) | 2 (5.0) | 2 (5.0) | 4 (10.0) | 5 (12.5) | 10 (25.0) | 10 (25.0) | 10 (25.0) | 10 (25.0) |
| 2.50 | 2 (5.0) | 3 (7.5) | 4 (10.0) | 4 (10.0) | 4 (10.0) | 7 (17.5) | 7 (17.5) | 7 (17.5) | 7 (17.5) | 7 (17.5) | 7 (17.5) |
| 7.91 | 10 (25.0) | 12 (30.0) | 12 (30.0) | 12 (30.0) | 12 (30.0) | 14 (35.0) | 14 (35.0) | 14 (35.0) | 14 (35.0) | 14 (35.0) | 14 (35.0) |
| 25.0 | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) | 40 (100) |

The values in parentheses express mortality (%) of *Daphnia*.

Table 3. Time (days) required to first brood production during exposure to dichlorobromomethane

| Concentration (mg/L) | Vessel No. | | | | Mean |
|-------------------------|------------|---|---|---|------|
| | 1 | 2 | 3 | 4 | |
| Control | 7 | 7 | 7 | 7 | 7.0 |
| 0.0250 | 7 | 7 | 7 | 7 | 7.0 |
| 0.0791 | 7 | 7 | 7 | 7 | 7.0 |
| 0.250 | 7 | 7 | 7 | 7 | 7.0 |
| 0.791 | 7 | 7 | 7 | 7 | 7.0 |
| 2.50 | 8 | 7 | 7 | 7 | 7.3 |
| 7.91 | - | - | - | - | - |
| 25.0 | - | - | - | - | - |

Table 4. Mean cumulative number of juveniles produced per adult ($\Sigma F_1/P$)
during exposure to dichlorobromomethane

| Concentration (mg/L) | Exposure time (day) | | | | | | | | | | |
|-------------------------|---------------------|---|---|---|---|---|---|-----|-----|-----|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.7 | 4.2 | 4.2 | 9.0 |
| 0.0250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.0 | 5.1 | 5.1 | 12.4 |
| 0.0791 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.3 | 4.8 | 4.8 | 11.6 |
| 0.250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 | 3.4 | 3.4 | 9.3 |
| 0.791 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.6 | 2.7 | 2.7 | 6.6 |
| 2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9 | 2.0 | 2.0 | 5.9 |
| 7.91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 4. (continued)

| Concentration (mg/L) | Exposure time (day) | | | | | | | | | | |
|-------------------------|---------------------|------|------|------|------|------|------|------|------|------|------|
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| Control | 15.2 | 15.2 | 30.7 | 45.7 | 45.7 | 58.2 | 71.7 | 71.7 | 75.2 | 84.9 | 85.0 |
| 0.0250 | 17.9 | 17.9 | 37.2 | 46.3 | 46.3 | 63.1 | 72.9 | 72.9 | 76.4 | 88.1 | 88.1 |
| 0.0791 | 16.8 | 16.8 | 32.5 | 45.9 | 45.9 | 56.3 | 66.8 | 66.8 | 69.4 | 80.1 | 80.3 |
| 0.250 | 13.0 | 13.0 | 28.5 | 40.2 | 40.2 | 54.9 | 66.7 | 66.7 | 69.3 | 78.8 | 79.0 |
| 0.791 | 8.4 | 8.4 | 21.4 | 31.6 | 31.6 | 43.6 | 53.9 | 53.9 | 56.4 | 71.8 | 71.8 |
| 2.50 | 9.5 | 9.5 | 14.0 | 24.5 | 24.5 | 31.0 | 43.3 | 43.5 | 45.9 | 63.7 | 65.0 |
| 7.91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 5. Calculated LC50 values of dichlorobromomethane for parental *Daphnia* based on observed concentrations

| Exposure time (day) | LC50 (mg/L) | 95-Percent confidence limits (mg/L) | Statistical method |
|------------------------|----------------|---|-----------------------|
| 1 | > 25.0 | - ~ - | - |
| 2 | > 25.0 | - ~ - | - |
| 4 | > 25.0 | - ~ - | - |
| 7 | > 25.0 | - ~ - | - |
| 14 | 7.49 | 5.95 ~ 9.75 | moving average |
| 21 | 6.11 | 4.57 ~ 8.47 | moving average |

Table 6. Calculated ErC50 values of dichlorobromomethane for inhibition of reproduction based on observed concentrations

| Exposure time (day) | ErC50 (mg/L) | 95-Percent confidence limits (mg/L) | Statistical method |
|------------------------|-----------------|---|-----------------------|
| 14 | 1.34 | 1.01 ~ 1.80 | moving average |
| 21 | 1.90 | 1.55 ~ 2.35 | moving average |

Table 7. Significance test of difference between the mean cumulative numbers of juveniles produced per adult in control and test vessels after 21 days exposure to dichlorobromomethane

| Concentration (mg/L) | Vessel No. | | | | Mean | S.D. | Significant difference |
|-------------------------|------------|------|------|------|------|-------|---------------------------|
| | 1 | 2 | 3 | 4 | | | |
| Control | 82.6 | 80.9 | 105 | 71.4 | 85.0 | 14.24 | |
| 0.0250 | 84.4 | 93.3 | 94.2 | 80.7 | 88.1 | 6.63 | |
| 0.0791 | 73.4 | 91.0 | 82.7 | 74.1 | 80.3 | 8.29 | |
| 0.250 | 80.1 | 71.9 | 80.5 | 83.6 | 79.0 | 5.01 | |
| 0.791 | 84.8 | 78.8 | 89.0 | 34.6 | 71.8 | 25.15 | |
| 2.50 | 82.9 | 66.2 | 76.1 | 34.8 | 65.0 | 21.24 | |
| 7.91 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | - |

The data of 7.91 and 25.0 mg/L were omitted from statistical analysis.

No observed effect concentration (NOECr) = 0.791 mg/L

Lowest effect concentration (LOECr) = 2.50 mg/L

The estimation of NOECr and LOECr was performed referring the result of a previous test (Supplement -1).

Table 8. Temperature of media during 21day *Daphnia* reproduction inhibition test to dichlorobromomethane

| Nominal concentration (mg/L) | | Temperature (°C) | | | | | | | | | | |
|------------------------------|-----|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | 0-day | 1-day | 2-day | 3-day | 4-day | 5-day | 6-day | 7-day | 8-day | 9-day | 10-day |
| Control | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.4 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 0.0250 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.4 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 0.0791 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.4 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 0.250 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.5 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 0.791 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.5 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 2.50 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.5 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 7.91 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.5 | 20.0 | 20.0 | 20.0 |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |
| 25.0 | New | 20.2 | 20.2 | 20.2 | 20.0 | 20.3 | 20.0 | 20.0 | 20.5 | 20.0 | 20.0 | n |
| | Old | | 19.8 | 19.8 | 20.3 | 20.2 | 20.0 | 20.0 | 20.0 | 19.8 | 20.3 | 20.2 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

n : No measurement was made because all *Daphnia* died at this observation time.

Table 8. (continued)

| Nominal concentration (mg/L) | | Temperature (°C) | | | | | | | | | | |
|------------------------------|-----|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 11-day | 12-day | 13-day | 14-day | 15-day | 16-day | 17-day | 18-day | 19-day | 20-day | 21-day |
| Control | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.1 | 20.1 | 19.9 | 19.9 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.3 | 20.1 | 19.9 | 19.6 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 0.0250 | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.1 | 20.1 | 19.9 | 19.9 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.2 | 20.1 | 19.9 | 19.5 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 0.0791 | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.1 | 20.1 | 19.9 | 19.9 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.2 | 20.1 | 19.9 | 19.5 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 0.250 | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.1 | 20.2 | 19.9 | 20.0 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.2 | 20.1 | 19.9 | 19.4 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 0.791 | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.1 | 20.2 | 20.0 | 20.0 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.2 | 20.1 | 19.9 | 19.4 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 2.50 | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.1 | 20.3 | 20.0 | 20.1 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.2 | 20.1 | 19.9 | 20.1 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 7.91 | New | 20.0 | 20.0 | 20.0 | 20.3 | 20.2 | 20.2 | 20.3 | 20.0 | 20.1 | 20.2 | |
| | Old | 20.1 | 19.8 | 20.2 | 20.1 | 19.9 | 20.2 | 20.0 | 20.1 | 20.1 | 20.2 | 19.8 |
| 25.0 | New | n | n | n | n | n | n | n | n | n | n | n |
| | Old | n | n | n | n | n | n | n | n | n | n | n |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

n : No measurement was made because all *Daphnia* died at this observation time.

Table 9. Dissolved oxygen concentrations of media during 21day *Daphnia* reproduction inhibition test to dichlorobromomethane

| Nominal concentration (mg/L) | | Dissolved oxygen concentration (mg/L) | | | | | | | | | | |
|------------------------------------|-----|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | 0-day | 1-day | 2-day | 3-day | 4-day | 5-day | 6-day | 7-day | 8-day | 9-day | 10-day |
| Control | New | 8.8 | 8.7 | 8.8 | 8.8 | 8.7 | 8.8 | 8.8 | 8.8 | 8.7 | 8.4 | 8.8 |
| | Old | | 9.0 | 8.6 | 8.8 | 8.5 | 8.4 | 8.3 | 8.2 | 8.1 | 7.9 | 8.6 |
| 0.0250 | New | 8.7 | 8.7 | 8.8 | 8.8 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | 8.8 |
| | Old | | 8.9 | 8.6 | 8.8 | 8.5 | 8.4 | 8.3 | 8.1 | 8.1 | 7.8 | 8.4 |
| 0.0791 | New | 8.7 | 8.7 | 8.8 | 8.8 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | 8.8 |
| | Old | | 8.9 | 8.5 | 8.8 | 8.4 | 8.3 | 8.3 | 8.2 | 8.1 | 7.8 | 8.4 |
| 0.250 | New | 8.7 | 8.7 | 8.7 | 8.8 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | 8.8 |
| | Old | | 8.9 | 8.5 | 8.7 | 8.5 | 8.3 | 8.2 | 8.2 | 8.1 | 7.8 | 8.4 |
| 0.791 | New | 8.7 | 8.7 | 8.7 | 8.8 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | 8.8 |
| | Old | | 8.8 | 8.4 | 8.7 | 8.4 | 8.4 | 8.3 | 8.1 | 8.0 | 7.8 | 8.2 |
| 2.50 | New | 8.7 | 8.7 | 8.7 | 8.8 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | 8.8 |
| | Old | | 8.8 | 8.5 | 8.7 | 8.4 | 8.4 | 8.2 | 8.3 | 8.1 | 7.8 | 8.2 |
| 7.91 | New | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | 8.8 |
| | Old | | 8.6 | 8.3 | 8.7 | 8.4 | 8.4 | 8.4 | 8.5 | 8.3 | 8.1 | 8.7 |
| 25.0 | New | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.8 | 8.8 | 8.7 | 8.7 | 8.4 | n |
| | Old | | 8.5 | 8.5 | 8.8 | 8.7 | 8.6 | 8.6 | 8.5 | 8.5 | 8.3 | 8.8 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

n : No measurement was made because all *Daphnia* died at this observation time.

Table 9. (continued)

| Nominal concentration (mg/L) | | Dissolved oxygen concentration (mg/L) | | | | | | | | | | |
|------------------------------------|-----|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 11-day | 12-day | 13-day | 14-day | 15-day | 16-day | 17-day | 18-day | 19-day | 20-day | 21-day |
| Control | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.0 | 8.9 | 9.0 | 8.9 | 9.0 | 8.9 | |
| | Old | 8.3 | 8.1 | 8.0 | 8.0 | 8.6 | 8.1 | 8.3 | 8.2 | 8.6 | 8.5 | 7.8 |
| 0.0250 | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.1 | 8.9 | 9.0 | 8.9 | 9.0 | 8.9 | |
| | Old | 8.2 | 7.9 | 8.0 | 8.0 | 8.6 | 8.2 | 8.2 | 7.9 | 8.5 | 8.4 | 7.9 |
| 0.0791 | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.1 | 8.9 | 9.0 | 8.9 | 9.0 | 9.0 | |
| | Old | 8.5 | 8.1 | 8.1 | 8.1 | 8.5 | 8.2 | 8.3 | 8.0 | 8.5 | 8.3 | 7.9 |
| 0.250 | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.1 | 8.9 | 9.0 | 8.9 | 9.0 | 9.0 | |
| | Old | 8.5 | 8.0 | 8.0 | 7.8 | 8.6 | 8.1 | 7.9 | 7.8 | 8.3 | 8.2 | 7.9 |
| 0.791 | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.1 | 8.9 | 9.0 | 8.9 | 9.0 | 8.9 | |
| | Old | 8.3 | 7.9 | 7.8 | 7.7 | 8.3 | 8.4 | 7.6 | 7.6 | 8.0 | 8.1 | 7.5 |
| 2.50 | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.1 | 8.9 | 9.0 | 8.9 | 9.0 | 9.0 | |
| | Old | 8.3 | 8.0 | 8.0 | 7.6 | 8.1 | 7.8 | 7.8 | 7.7 | 8.1 | 8.3 | 7.9 |
| 7.91 | New | 8.8 | 8.9 | 9.0 | 8.9 | 9.1 | 8.9 | 9.0 | 8.9 | 9.0 | 9.0 | |
| | Old | 8.8 | 8.7 | 8.7 | 8.6 | 8.8 | 8.4 | 8.7 | 8.5 | 8.7 | 8.4 | 8.1 |
| 25.0 | New | n | n | n | n | n | n | n | n | n | n | n |
| | Old | n | n | n | n | n | n | n | n | n | n | n |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

n : No measurement was made because all *Daphnia* died at this observation time.

Table 10. pH values of media during 21day *Daphnia* reproduction inhibition test to dichlorobromomethane

| Nominal concentration (mg/L) | | pH | | | | | | | | | | |
|------------------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | 0-day | 1-day | 2-day | 3-day | 4-day | 5-day | 6-day | 7-day | 8-day | 9-day | 10-day |
| Control | New | 7.72 | 7.50 | 7.45 | 7.49 | 7.35 | 7.47 | 7.49 | 7.51 | 7.43 | 7.35 | 7.40 |
| | Old | | 7.79 | 7.58 | 7.44 | 7.54 | 7.38 | 7.63 | 7.50 | 7.44 | 7.36 | 7.39 |
| 0.0250 | New | 7.71 | 7.46 | 7.48 | 7.40 | 7.36 | 7.52 | 7.60 | 7.47 | 7.55 | 7.37 | 7.46 |
| | Old | | 7.81 | 7.56 | 7.53 | 7.54 | 7.38 | 7.47 | 7.59 | 7.40 | 7.34 | 7.34 |
| 0.0791 | New | 7.70 | 7.51 | 7.52 | 7.42 | 7.38 | 7.51 | 7.65 | 7.45 | 7.58 | 7.41 | 7.49 |
| | Old | | 7.86 | 7.55 | 7.52 | 7.52 | 7.36 | 7.43 | 7.62 | 7.40 | 7.35 | 7.34 |
| 0.250 | New | 7.66 | 7.51 | 7.56 | 7.49 | 7.36 | 7.50 | 7.66 | 7.46 | 7.59 | 7.40 | 7.49 |
| | Old | | 7.86 | 7.56 | 7.55 | 7.53 | 7.35 | 7.42 | 7.64 | 7.41 | 7.35 | 7.33 |
| 0.791 | New | 7.70 | 7.52 | 7.56 | 7.49 | 7.38 | 7.53 | 7.66 | 7.44 | 7.59 | 7.40 | 7.52 |
| | Old | | 7.84 | 7.60 | 7.52 | 7.53 | 7.36 | 7.42 | 7.66 | 7.37 | 7.34 | 7.30 |
| 2.50 | New | 7.67 | 7.58 | 7.62 | 7.51 | 7.38 | 7.52 | 7.65 | 7.45 | 7.61 | 7.42 | 7.57 |
| | Old | | 7.82 | 7.65 | 7.52 | 7.53 | 7.36 | 7.44 | 7.68 | 7.49 | 7.32 | 7.29 |
| 7.91 | New | 7.68 | 7.58 | 7.57 | 7.53 | 7.37 | 7.48 | 7.67 | 7.47 | 7.63 | 7.44 | 7.56 |
| | Old | | 7.78 | 7.61 | 7.53 | 7.52 | 7.36 | 7.47 | 7.70 | 7.53 | 7.40 | 7.35 |
| 25.0 | New | 7.67 | 7.59 | 7.55 | 7.56 | 7.41 | 7.42 | 7.64 | 7.51 | 7.63 | 7.45 | n |
| | Old | | 7.74 | 7.61 | 7.55 | 7.56 | 7.37 | 7.46 | 7.69 | 7.60 | 7.46 | 7.41 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

n : No measurement was made because all *Daphnia* died at this observation time.

Table 10. (continued)

| Nominal concentration (mg/L) | | pH | | | | | | | | | | |
|------------------------------|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 11-day | 12-day | 13-day | 14-day | 15-day | 16-day | 17-day | 18-day | 19-day | 20-day | 21-day |
| Control | New | 7.64 | 7.63 | 7.59 | 7.65 | 7.46 | 7.50 | 7.43 | 7.45 | 7.41 | 7.45 | |
| | Old | 7.54 | 7.42 | 7.44 | 7.51 | 7.45 | 7.49 | 7.27 | 7.38 | 7.42 | 7.36 | 7.37 |
| 0.0250 | New | 7.63 | 7.63 | 7.66 | 7.65 | 7.46 | 7.56 | 7.48 | 7.45 | 7.43 | 7.48 | |
| | Old | 7.49 | 7.44 | 7.40 | 7.49 | 7.44 | 7.44 | 7.29 | 7.35 | 7.40 | 7.27 | 7.39 |
| 0.0791 | New | 7.64 | 7.65 | 7.68 | 7.65 | 7.49 | 7.59 | 7.50 | 7.44 | 7.44 | 7.47 | |
| | Old | 7.50 | 7.44 | 7.41 | 7.52 | 7.46 | 7.34 | 7.30 | 7.34 | 7.39 | 7.25 | 7.37 |
| 0.250 | New | 7.66 | 7.67 | 7.69 | 7.65 | 7.53 | 7.59 | 7.53 | 7.47 | 7.46 | 7.49 | |
| | Old | 7.48 | 7.46 | 7.41 | 7.48 | 7.45 | 7.33 | 7.21 | 7.30 | 7.37 | 7.26 | 7.35 |
| 0.791 | New | 7.65 | 7.70 | 7.71 | 7.70 | 7.52 | 7.52 | 7.54 | 7.49 | 7.50 | 7.49 | |
| | Old | 7.46 | 7.46 | 7.38 | 7.43 | 7.40 | 7.30 | 7.19 | 7.31 | 7.37 | 7.24 | 7.33 |
| 2.50 | New | 7.66 | 7.70 | 7.72 | 7.72 | 7.52 | 7.57 | 7.56 | 7.45 | 7.53 | 7.51 | |
| | Old | 7.46 | 7.48 | 7.42 | 7.42 | 7.40 | 7.39 | 7.17 | 7.31 | 7.35 | 7.20 | 7.37 |
| 7.91 | New | 7.66 | 7.73 | 7.74 | 7.72 | 7.53 | 7.56 | 7.53 | 7.43 | 7.53 | 7.49 | |
| | Old | 7.55 | 7.63 | 7.54 | 7.65 | 7.53 | 7.45 | 7.36 | 7.42 | 7.38 | 7.22 | 7.41 |
| 25.0 | New | n | n | n | n | n | n | n | n | n | n | n |
| | Old | n | n | n | n | n | n | n | n | n | n | n |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

n : No measurement was made because all *Daphnia* died at this observation time.

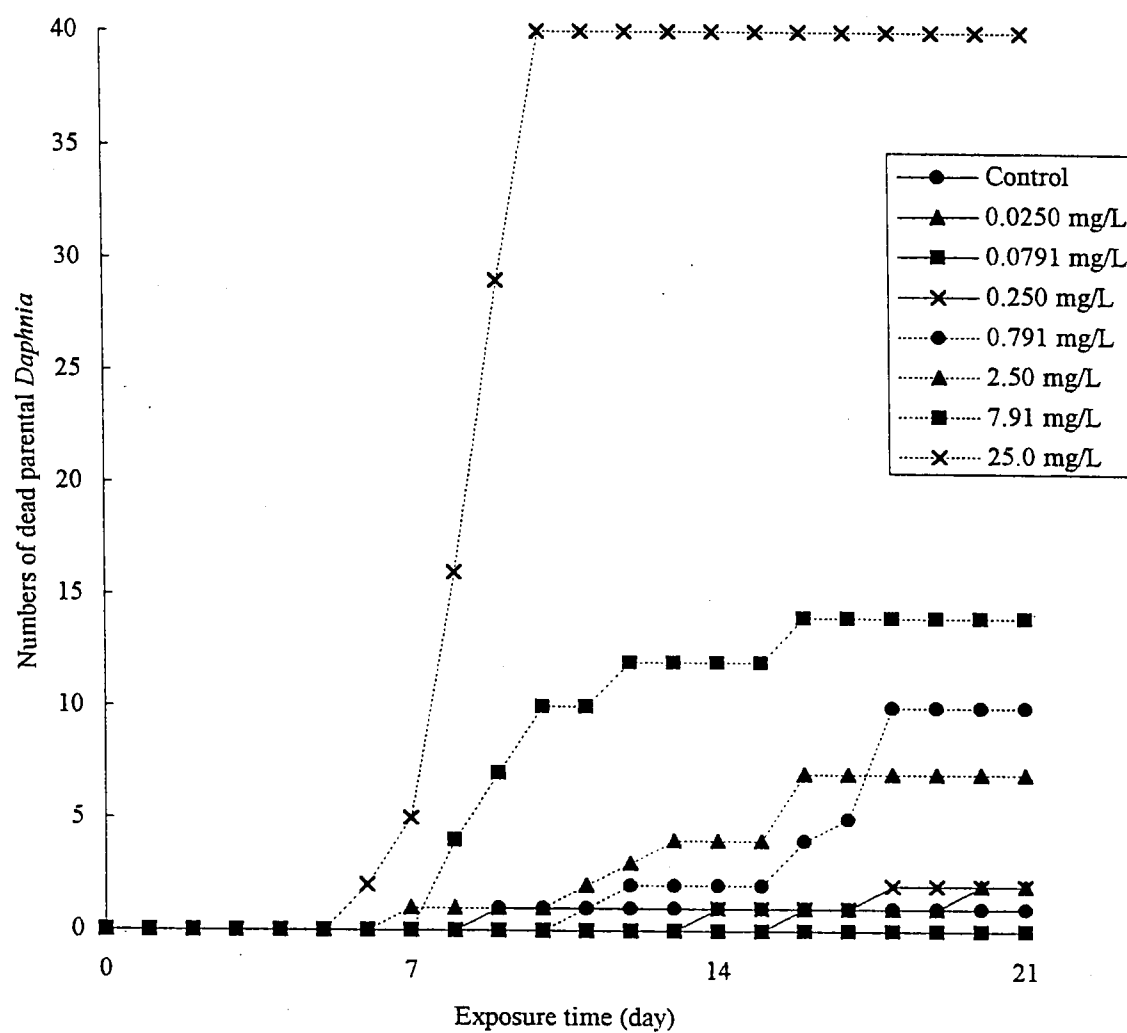


Figure 1. Cumulative numbers of dead parental *Daphnia*.

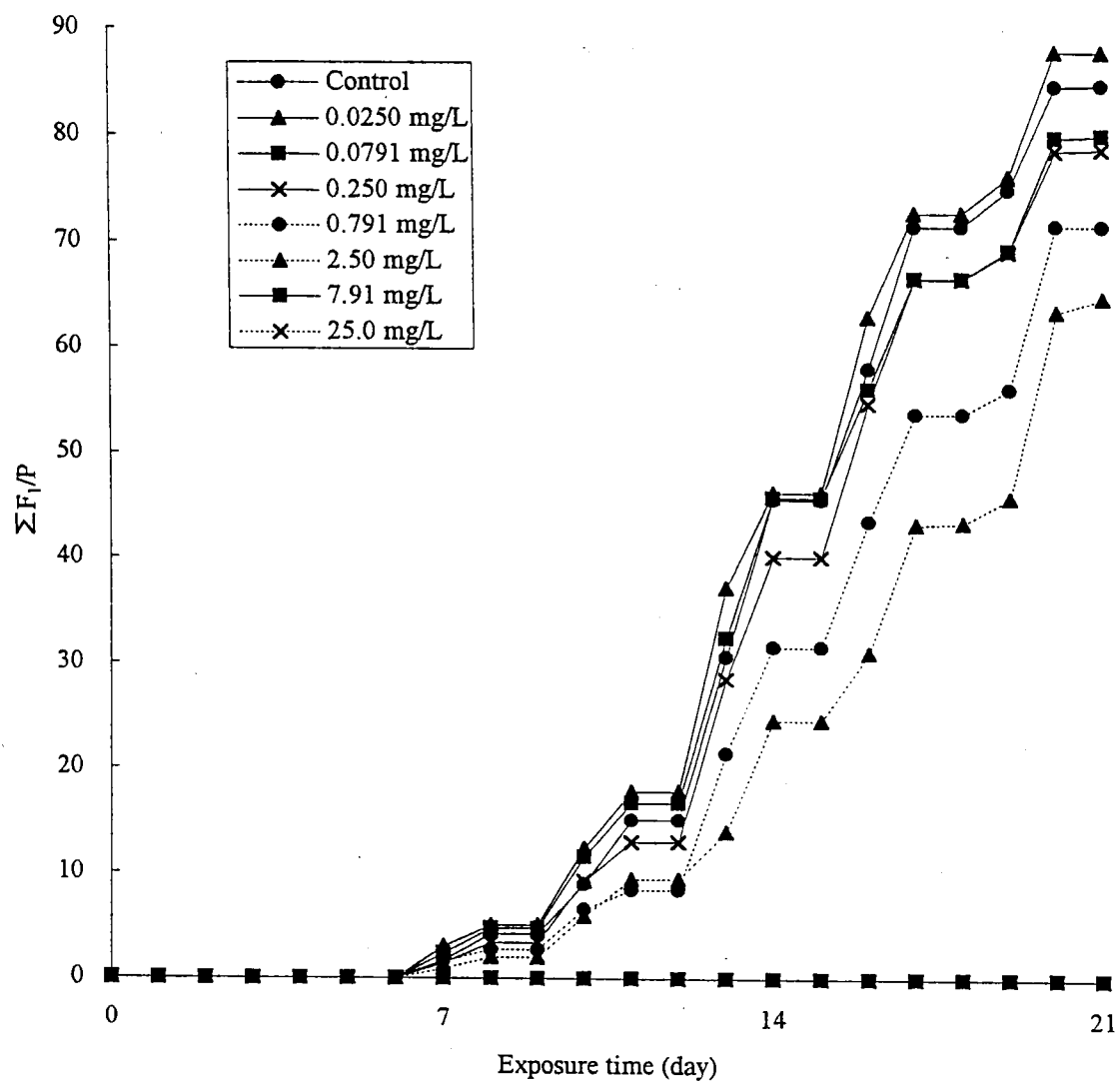


Figure 2. Mean cumulative numbers of juveniles produced per adult ($\Sigma F_1/P$).

付属資料－1

希釈水の水質
(全2頁)

Appendix 1. Water quality of dilution water

| Parameter | Concentration | Lower limit |
|-------------------------------------|---------------|--------------|
| | 1995.Nov.28 | of detection |
| pH | 6.9 | |
| COD (mg/L) | 0.2 | |
| Coliform group bacteria (MPN/100mL) | 0 | |
| Total phosphorus (mg/L) | 0.03 | |
| Total mercury (mg/L) | N.D. | 0.0005 |
| Copper (mg/L) | N.D. | 0.005 |
| Cadmium (mg/L) | N.D. | 0.005 |
| Zinc (mg/L) | 0.01 | 0.01 |
| Lead (mg/L) | N.D. | 0.005 |
| Aluminium (mg/L) | N.D. | 0.1 |
| Nickel (mg/L) | N.D. | 0.01 |
| Total chromium (mg/L) | N.D. | 0.02 |
| Manganese (mg/L) | 0.13 | 0.01 |
| Tin (mg/L) | N.D. | 0.5 |
| Iron (mg/L) | 0.02 | 0.01 |
| Cyanide (mg/L) | N.D. | 0.1 |
| Free chlorine (mg/L) | N.D. | 0.01 |
| Bromide ion (mg/L) | N.D. | 0.1 |
| Fluoride (mg/L) | N.D. | 0.15 |
| Sulfide ion (mg/L) | N.D. | 0.1 |
| Ammonia nitrogen (mg/L) | 0.01 | |
| Arsenic (mg/L) | N.D. | 0.002 |
| Selenium (mg/L) | N.D. | 0.002 |
| Evaporation residue (mg/L) | 118 | |
| Electric conductivity (μ S/cm) | 147 | |
| Total hardness (as CaCO3) (mg/L) | 35.5 | |
| Alkalinity (mg/L) | 21.0 | |
| Sodium (mg/L) | 12.85 | |
| Potassium (mg/L) | 3.55 | |
| Calcium (mg/L) | 9.2 | |
| Magnesium (mg/L) | 3.06 | |

Appendix 1. (continued)

| Parameter | | Concentration | Lower limit |
|----------------------|--------|---------------|--------------|
| | | 1995.Nov.28 | of detection |
| 1,2-Dichloropropane | (mg/L) | N.D. | 0.006 |
| Diazinon | (mg/L) | N.D. | 0.0005 |
| Isoxathion | (mg/L) | N.D. | 0.0008 |
| Fenitrothion (MEP) | (mg/L) | N.D. | 0.0003 |
| Isoprothiolane | (mg/L) | N.D. | 0.004 |
| Oxine cupper | (mg/L) | N.D. | 0.004 |
| Chlorothalonil (TPN) | (mg/L) | N.D. | 0.004 |
| Propyzamide | (mg/L) | N.D. | 0.0008 |
| EPN | (mg/L) | N.D. | 0.0006 |
| Dichlorvos (DDVP) | (mg/L) | N.D. | 0.001 |
| Fenobucarb (BPMC) | (mg/L) | N.D. | 0.002 |
| Iprobenfos (IBP) | (mg/L) | N.D. | 0.0008 |
| Chlornitrofen (CNP) | (mg/L) | N.D. | 0.0005 |
| Thiram | (mg/L) | N.D. | 0.0006 |
| Simazine (CAT) | (mg/L) | N.D. | 0.0003 |
| Benthiocarb | (mg/L) | N.D. | 0.002 |
| PCB | (mg/L) | N.D. | 0.0005 |

N.D. : not detected

付属資料－2

試験液の分析方法及び分析チャート

(全 11 頁)

試 験 名 : ミジンコ繁殖阻害試験

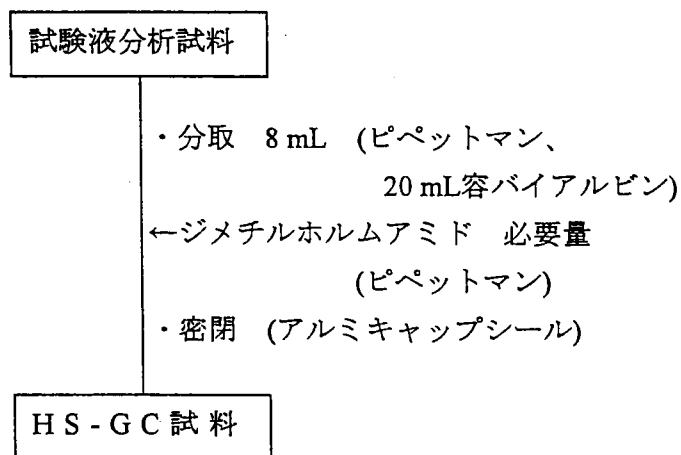
被験物質物質名 : ジクロロブロモメタン

1) 試験液の分析方法

① 試験液の前処理操作

混合した溶液は、そのまま若しくは蒸留水で希釈して、以下のフロースキームに従いヘッドスペース - ガスクロマトグラフィー(HS-GC)によって分析した。

フロースキーム



最終定容溶液中の被験物質濃度は、SOP/ANA/522 に従ってクロマトグラム上の被験物質のピーク面積を濃度既知の標準溶液のピーク面積と比較し、比例計算して求めた。

② 被験物質溶液の調製

被験物質 100 mg を正確にはかりとり、ジメチルホルムアミドに溶解して 1,000 mg/L の被験物質溶液を調製した。これをジメチルホルムアミドで希釈して 10 及び 100 mg/L の被験物質溶液を調製した。

③ 標準溶液の調製

分析試料中の被験物質濃度を求めるための標準溶液の調製は次のようにして行った。20 mL 容バイアルビンに蒸留水 8 mL を添加し、これに 1,000 mg/L の被験物質溶液を 40 μ L 添加した後、ただちにアルミキャップシールを行い、5.0 mg/L の標準溶液を調製した。

2) GCの分析条件

ヘッドスペース オートサンプラー条件

| | |
|------------|--|
| ・機 器 | PERKIN ELMER Head Space Sampler HS40 PERKIN ELMER 製 |
| ・サンプル温度 | 80℃ |
| ・加 温 時 間 | 60 分 |
| ・ニードル温度 | 140℃ |
| ・トランスファー温度 | 150℃ |

ガスクロマトグラフ条件

| | |
|------------|--|
| ・機 器 | HP5890 Series - II (機器 No. GC-45) HEWLETT PACKARD 製 |
| ・検 出 器 | 水素炎イオン化検出器 (FID) |
| ・検 出 器 温 度 | 250℃ |
| ・カ ラ ム | NeutraBond-1 (0.25 mmID×50 m) |
| ・カ ラ ム 温 度 | 40℃ (2 min) → 200℃ (2 min) |
| ・昇 温 速 度 | 10℃/min |
| ・試料導入部温度 | 200℃ |
| ・キャリアーガス | ヘリウム 160 kPa |
| ・水 素 | 1.2 Kg/cm ² |
| ・空 気 | 2.0 Kg/cm ² |
| ・スプリット比 | 1:50 |
| ・感 度 | レンジ 1v |

3) 検量線の作成

1) ③の標準溶液の調製と同様にして5.0及び25 mg/Lの標準溶液を調製した。また、10及び100 mg/Lの被験物質溶液より、それぞれ0.20及び1.0 mg/Lの標準溶液を調製した。これらを分析機器の定量条件に従って分析し、得られたそれぞれのクロマトグラム上のピーク面積と濃度により、検量線を作成した。

Content of figure

- Figure 1. Calibration curve of dichlorobromomethane by GC analysis.
- Figure 2-1. Example of chromatogram.
(standard solution of 1.0 mg/L, 0-day)
- Figure 2-2. Example of chromatogram.
(fresh test solution of 2.50 mg/L as nominal concentration, 0-day)
- Figure 2-3. Example of chromatogram.
(fresh test solution of control, 0-day)
- Figure 2-4. Example of chromatogram.
(standard solution of 1.0 mg/L, 1-day)
- Figure 2-5. Example of chromatogram.
(expired test solution of 2.50 mg/L as nominal concentration, 1-day)
- Figure 2-6. Example of chromatogram.
(expired test solution of control, 1-day)

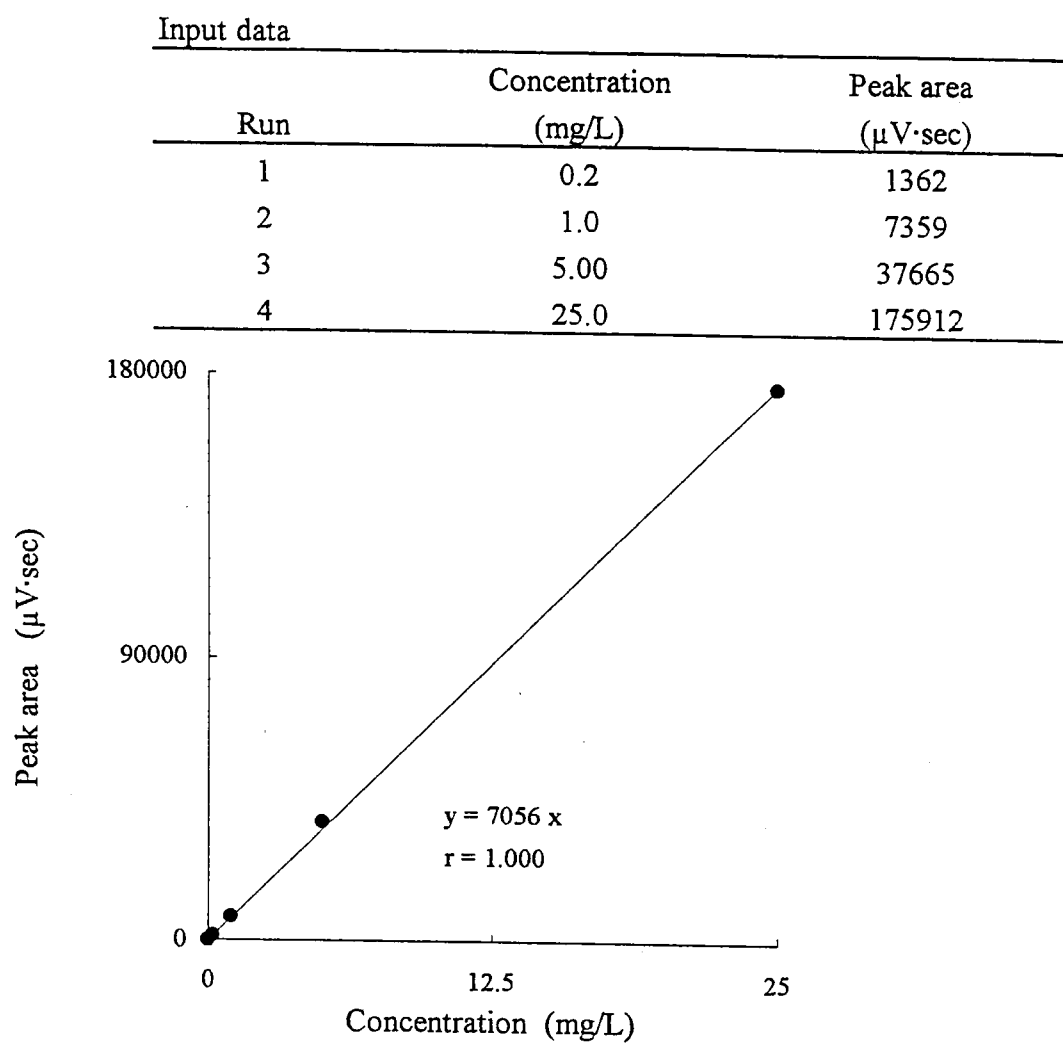


Figure 1. Calibration curve of dichlorobromomethane by GC analysis.

1996. 1. 25. [REDACTED]

(3/11)
1996.4.2

CLASS-GC10 システム番号=2 Ch=1 レポート番号=67 データ=91508HIS.D34 96/04/01 19:14:36

サンプル : DCBV/std.

ID : 1

サンプル量 : 100

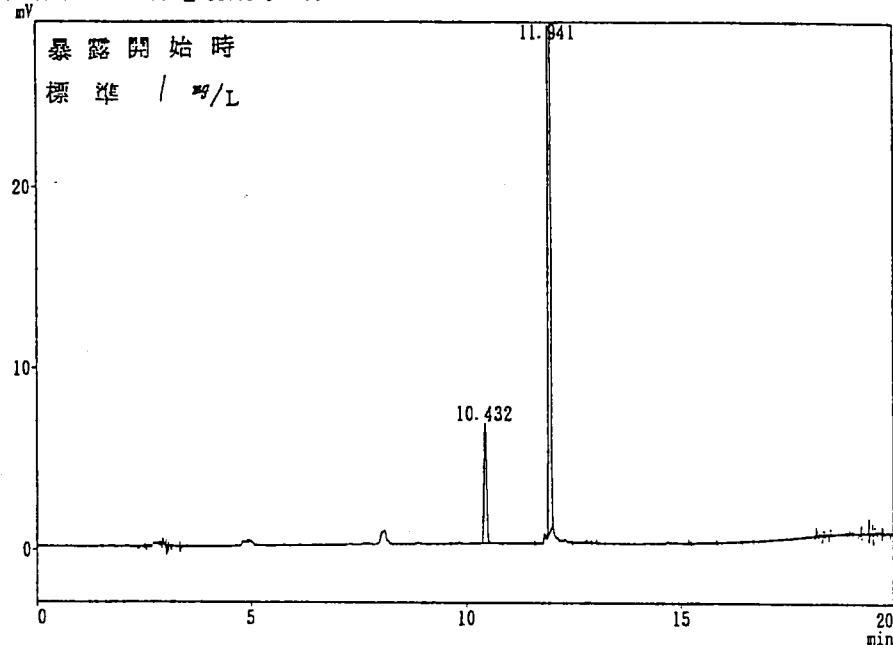
タイプ : 標準試料

検出器 : FID

オペレータ名:

試験番号 91508

*** クロマトグラム *** ファイル名:91508HIS.C34



*** ピークレポート ***

| PKNO | TIME | AREA (uV·Sec) | HEIGHT | WK | IDNO | CONC | NAME |
|------|--------|---------------|--------|----|------|------|------|
| 1 | 10.432 | 29635 | 6491 | | 1 | | DCBV |
| 2 | 11.941 | 466026 | 173733 | | | | |

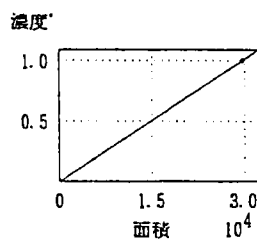
495661 180224

*** キャリブレーション結果 ***

** ID テーブル **

| IDNO | 成分名 | 時間 | 濃度 | F1 | F2 |
|------|------|-------|----|--------------|----|
| 1 | DCBV | 10.44 | 1 | 3.37437e-005 | |

** 検量線 **



IDNO: 1
NAME: DCBV
TIME: 10.44

| 濃度 | 面積 |
|-------|-------|
| (1) 1 | 29635 |

| RF1 | RF2 |
|------------------|-----|
| (1) 3.37437e-005 | 0 |

r2 = 1

Figure 2-1. Example of chromatogram.
(standard solution of 1.0 mg/L, 0-day)

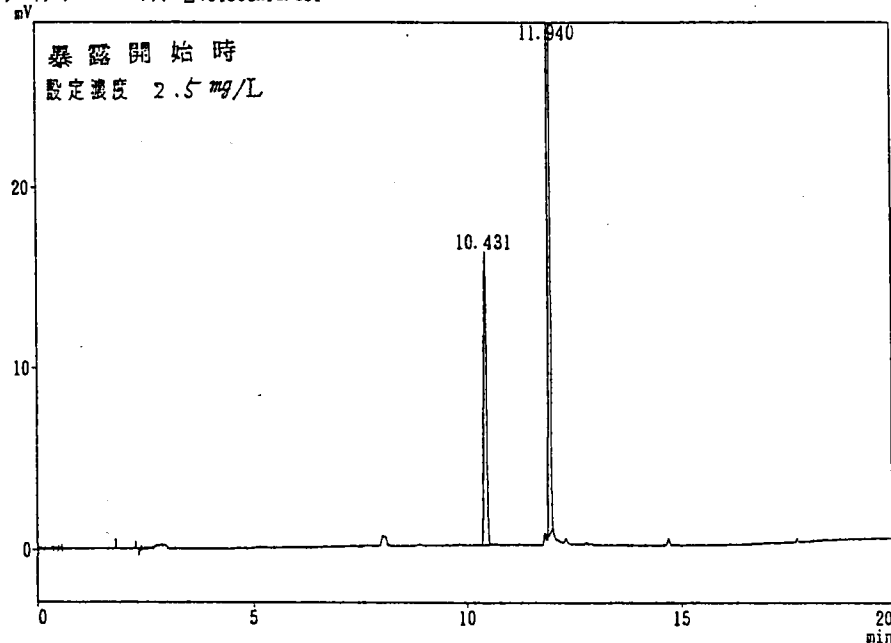
(6/11)
1996. 4. 2

CLASS-GC10 システム番号=2 Ch=1, レポート番号=70 データ=91508H1C.D31 96/04/01 21:00:18

サンプル名 : DCBM/R3/04-100d
ID : 2.50 入力濃度 2.5 mg/L
サンプル量 : 100
タイプ : 未知試料
検出器 : FID
オペレーター名 :

試験番号 91508

*** クロマトグラム *** ファイル名: 91508H1C.D31



*** ピークレポート ***

| PKNO | TIME | AREA(μV·Sec) | HEIGHT | NK | IDNO | CONC | NAME |
|------|--------|--------------|--------|----|------|--------|------|
| 1 | 10.431 | 72400 | 15903 | | 1 | 2.4430 | DCBM |
| 2 | 11.940 | 457603 | 172165 | | | | |
| | | 530004 | 188068 | | | 2.4430 | |

Figure 2-2. Example of chromatogram.

(fresh test solution of 2.50 mg/L as nominal concentration, 0-day)

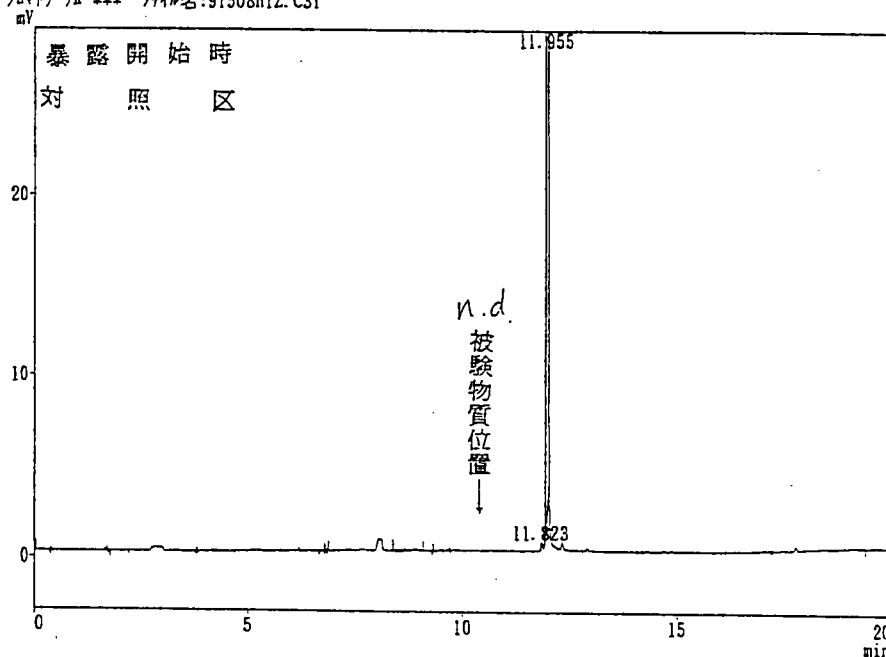
(11/11)
1996.4.2

CLASS-GC10 システム番号=2 Ch=1 レポート番号=51 データ=91508H1Z.D31 96/04/01 23:56:28

サンプル : DCBM/R8/8-1-00
ID : 対照区
サンプル量 : 100
タイプ : 未知試料
検出器 : FID
オペレータ名 :

試験番号 91508

*** クロマトグラム *** ファイル名: 91508H1Z.C31



*** ピークレポート ***

| PKNO | TIME | AREA(μV·Sec) | HEIGHT | MK | IDNO | CONC | NAME |
|------|--------|--------------|--------|----|------|------|------|
| 1 | 11.823 | 1135 | 411 | | | | |
| 2 | 11.955 | 412207 | 165651 | | | | |

413341 166062

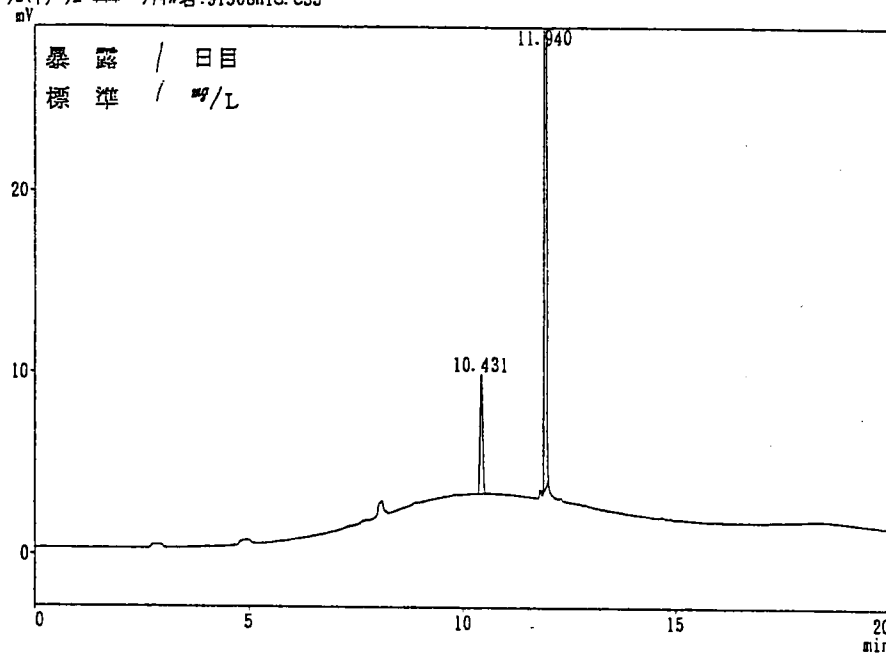
Figure 2-3. Example of chromatogram.
(fresh test solution of control, 0-day)

1996.4.2

CLASS-GC10 システム番号=2 Ch=1 検体番号=101 データ=91508H1S.D33 96/04/01 18:39:18
 サンプル : DCBM/std.
 ID : 1
 サンプル量 : 100
 タイプ : 標準試料
 検出器 : WFID
 サンプル名 :

試験番号 91508

*** クロマトグラム *** ファイル名: 91508H1S.C33



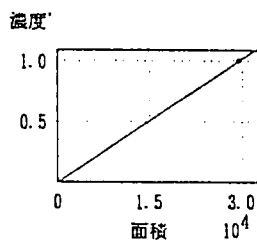
| PKNO | TIME | AREA (μV.Sec) | HEIGHT | WK | IDNO | CONC | NAME |
|------|--------|---------------|--------|----|------|------|------|
| 1 | 10.431 | 29403 | 6497 | | 1 | | DCBM |
| 2 | 11.940 | 432924 | 164457 | | | | |
| | | 462327 | 170954 | | | | |

*** サンプルレーション結果 ***

** ID テーブル **

| IDNO | 成分名 | 時間 | 濃度 | F1 | F2 |
|------|------|-------|----|------------|----|
| 1 | DCBM | 10.44 | 1 | 3.401e-005 | |

** 検量線 **



IDNO: 1
 NAME: DCBM
 TIME: 10.44
 (1) 濃度 面積
 (1) RF1 3.401e-005 RF2 0
 r2 = 1

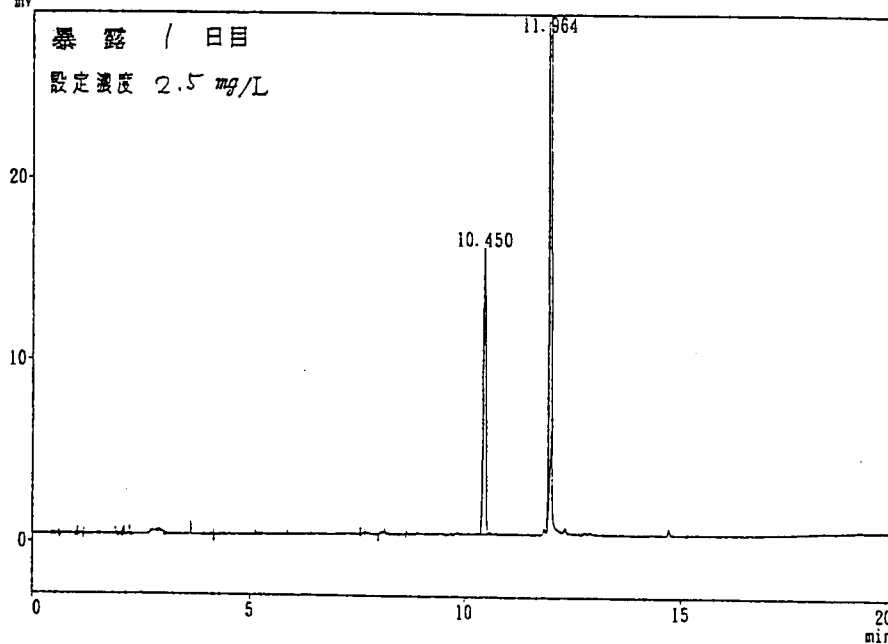
Figure 2-4. Example of chromatogram.
 (standard solution of 1.0 mg/L, 1-day)

(6/11) 1996.4.2

CLASS-GC10 システム番号=2 Ch=1 検出器番号=104 検出器=91508H2C.D30 96/04/02 02:52:38
 サンプル名 : DCBN/R3/1d
 ID : 2.50
 サンプル量 : 100
 タイプ : 未知試料
 検出器 : VFID
 サンプル名 :

試験番号 91508

*** クロマトグラム *** ファイル名:91508H2C.C30



| PKNO | TIME | AREA(μV·Sec) | HEIGHT | MK | IDNO | CONC | NAME |
|------|--------|--------------|--------|--------|------|--------|------|
| 1 | 10.450 | 70402 | 15319 | | 1 | 2.3944 | DCBN |
| 2 | 11.964 | 396912 | 145250 | | | | |
| | | 467314 | 160569 | | | | |
| | | | | 2.3944 | | | |

Figure 2-5. Example of chromatogram.
 (expired test solution of 2.50 mg/L as nominal concentration, 1-day)

(11/11)

1996. 4. 2

CLASS-GC10 システム番号=2 Ch=1 検出器番号=110 データ=91508H22.D30 96/04/02 05:48:50

サンプル : DCBM/R8/1d

ID : 対照区

サンプル量 : 100

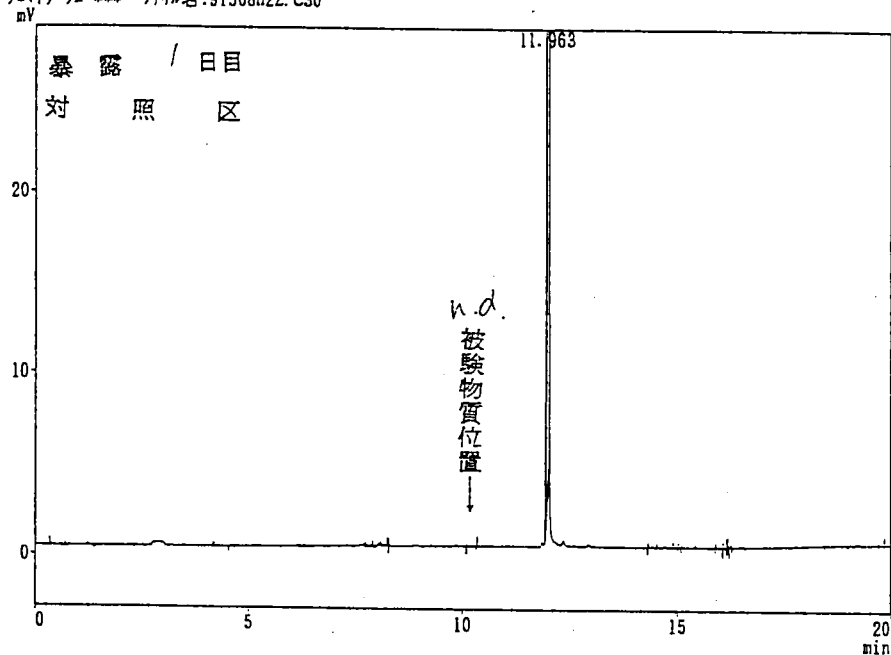
タイプ : 未知試料

検出器 : FID

オペレータ名:

試験番号 91508

*** クロマトグラム *** ファイル名:91508H22.C30



*** ピークレポート ***

| PKNO | TIME | AREA (uV·Sec) | HEIGHT | NK | IDNO | CONC | NAME |
|------|--------|---------------|--------|----|------|------|------|
| 1 | 11.963 | 335120 | 124613 | | | | |
| | | 335120 | 124613 | | | | |

Figure 2-6. Example of chromatogram.
(expired test solution of control, 1-day)

付属資料－ 3

ミジンコの観察結果

(全 8 頁)

Appendix 3-1. Result of reproduction test

| | | (Nominal concentration : Control) | | | | | | | | | | | | | | | | | | | | | Total | |
|---------|---------------------------|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|
| Rep. No | Counts | Time | | | | | | | | | | | | | | | | | | | | | | |
| | | 4/1 | 4/2 | 4/3 | 4/4 | 4/5 | 4/6 | 4/7 | 4/8 | 4/9 | 4/10 | 4/11 | 4/12 | 4/13 | 4/14 | 4/15 | 4/16 | 4/17 | 4/18 | 4/19 | 4/20 | 4/21 | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 7 | 0 | 49 | 20 | 0 | 220 | 87 | 0 | 202 | 74 | 0 | 90 | 39 | 826 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 6 | 14 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 7 | 0 | 50 | 20 | 0 | 221 | 87 | 0 | 204 | 74 | 0 | 90 | 45 | 840 | |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 | 0.7 | 0.0 | 4.9 | 2.0 | 0.0 | 22.0 | 8.7 | 0.0 | 20.2 | 7.4 | 0.0 | 9.0 | 3.9 | 82.6 | |
| 2 | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 | 4.5 | 4.5 | 9.4 | 11.4 | 11.4 | 33.4 | 42.1 | 42.1 | 62.3 | 69.7 | 69.7 | 78.7 | 82.6 | 82.6 | | |
| | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 36 | 0 | 37 | 94 | 0 | 159 | 140 | 0 | 127 | 117 | 0 | 3 | 89 | 809 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 13 | 4 | 0 | 0 | 6 | 31 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 36 | 0 | 40 | 95 | 0 | 163 | 140 | 0 | 140 | 121 | 0 | 3 | 95 | 0 | 840 |
| 3 | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 3.6 | 0.0 | 3.7 | 9.4 | 0.0 | 15.9 | 14.0 | 0.0 | 12.7 | 11.7 | 0.0 | 0.3 | 8.9 | 80.9 | |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 4.3 | 4.3 | 8.0 | 17.4 | 17.4 | 33.3 | 47.3 | 47.3 | 60.0 | 71.7 | 71.7 | 72.0 | 80.9 | 80.9 | | |
| | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 21 | 0 | 72 | 85 | 0 | 134 | 178 | 0 | 114 | 186 | 0 | 48 | 198 | 1050 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | |
| 4 | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 21 | 0 | 74 | 85 | 0 | 135 | 178 | 0 | 114 | 186 | 0 | 48 | 201 | 0 | 1056 |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 2.1 | 0.0 | 7.2 | 8.5 | 0.0 | 13.4 | 17.8 | 0.0 | 11.4 | 18.6 | 0.0 | 4.8 | 19.8 | 0.0 | 105.0 |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 3.5 | 3.5 | 10.7 | 19.2 | 19.2 | 32.6 | 50.4 | 50.4 | 61.8 | 80.4 | 80.4 | 85.2 | 105.0 | 105.0 | | |
| | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 37 | 0 | 29 | 43 | 0 | 97 | 175 | 0 | 54 | 144 | 0 | 0 | 55 | 4 | 647 |
| 5 | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 5 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 37 | 0 | 31 | 43 | 0 | 97 | 175 | 0 | 55 | 144 | 0 | 0 | 57 | 4 | 652 |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 3.7 | 0.0 | 3.2 | 4.8 | 0.0 | 10.8 | 19.4 | 0.0 | 6.0 | 16.0 | 0.0 | 0.0 | 6.1 | 0.4 | 71.4 |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 4.6 | 4.6 | 7.8 | 12.6 | 12.6 | 23.4 | 42.8 | 42.8 | 48.8 | 64.8 | 64.8 | 64.8 | 70.9 | 71.4 | | |

Appendix 3-2 Result of reproduction test

(Nominal concentration : 0.0250 mg/L)

| | | | (Nominal concentration : 0.0250 mg/L) | | | | | | | | | | | | | | | | | | | | | |
|---------|---------------------------|------------------|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Rep. No | Counts | | Time | | | | | | | | | | | | | | | | | | | | | Total |
| | | | 4/1 | 4/2 | 4/3 | 4/4 | 4/5 | 4/6 | 4/7 | 4/8 | 4/9 | 4/10 | 4/11 | 4/12 | 4/13 | 4/14 | 4/15 | 4/16 | 4/17 | 4/18 | 4/19 | 4/20 | 4/21 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | 0 | 60 | 68 | 0 | 186 | 82 | 0 | 198 | 80 | 0 | 24 | 118 | 0 | 844 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 10 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | 0 | 62 | 68 | 0 | 187 | 82 | 0 | 200 | 80 | 0 | 24 | 123 | 0 | 854 |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 0.0 | 6.0 | 6.8 | 0.0 | 18.6 | 8.2 | 0.0 | 19.8 | 8.0 | 0.0 | 2.4 | 11.8 | 0.0 | 84.4 |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 2.8 | 2.8 | 8.8 | 15.6 | 15.6 | 34.2 | 42.4 | 42.4 | 62.2 | 70.2 | 70.2 | 72.6 | 84.4 | 84.4 | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 19 | 0 | 89 | 45 | 0 | 215 | 80 | 0 | 175 | 90 | 0 | 43 | 137 | 0 | 933 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 19 | 0 | 90 | 45 | 0 | 219 | 80 | 0 | 176 | 90 | 0 | 43 | 137 | 0 | 939 |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 1.9 | 0.0 | 8.9 | 4.5 | 0.0 | 21.5 | 8.0 | 0.0 | 17.5 | 9.0 | 0.0 | 4.3 | 13.7 | 0.0 | 93.3 |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 5.9 | 5.9 | 14.8 | 19.3 | 19.3 | 40.8 | 48.8 | 48.8 | 66.3 | 75.3 | 75.3 | 79.6 | 93.3 | 93.3 | | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 12 | 0 | 74 | 26 | 0 | 216 | 96 | 0 | 182 | 101 | 0 | 47 | 141 | 0 | 926 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 12 | 0 | 75 | 27 | 0 | 216 | 96 | 0 | 182 | 101 | 0 | 47 | 143 | 0 | 930 |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.1 | 1.2 | 0.0 | 7.4 | 2.6 | 0.0 | 21.6 | 9.6 | 0.0 | 18.2 | 10.1 | 0.0 | 4.7 | 15.7 | 0.0 | 94.2 |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.1 | 4.3 | 4.3 | 11.7 | 14.3 | 14.3 | 35.9 | 45.5 | 45.5 | 63.7 | 73.8 | 73.8 | 78.5 | 94.2 | 94.2 | | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 37 | 0 | 71 | 80 | 0 | 157 | 106 | 0 | 110 | 117 | 0 | 21 | 53 | 0 | 787 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 9 | 3 | 0 | 0 | 4 | 0 | 20 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 37 | 0 | 71 | 80 | 0 | 160 | 107 | 0 | 119 | 120 | 0 | 21 | 57 | 0 | 807 |
| | | Reproductivity/P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 3.7 | 0.0 | 7.1 | 8.0 | 0.0 | 15.7 | 10.6 | 0.0 | 11.6 | 12.3 | 0.0 | 2.3 | 5.9 | 0.0 | 80.7 |
| | Cumulative reproductivity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 7.2 | 7.2 | 14.3 | 22.3 | 22.3 | 38.0 | 48.6 | 48.6 | 60.2 | 72.5 | 72.5 | 74.8 | 80.7 | 80.7 | | |

Appendix 3-3. Result of reproduction test

(Nominal concentration : 0.0791 mg/L)

| Rep. No | Counts | | Time | | | | | | | | | | | | | | | | | | | | | Total |
|---------|---------------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| | | | 4/1 | 4/2 | 4/3 | 4/4 | 4/5 | 4/6 | 4/7 | 4/8 | 4/9 | 4/10 | 4/11 | 4/12 | 4/13 | 4/14 | 4/15 | 4/16 | 4/17 | 4/18 | 4/19 | 4/20 | 4/21 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 19 | 0 | 76 | 40 | 0 | 199 | 101 | 0 | 117 | 38 | 0 | 50 | 66 | 0 | 734 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 12 | 1 | 0 | 2 | 1 | 0 | 21 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 19 | 0 | 79 | 40 | 0 | 201 | 101 | 0 | 129 | 39 | 0 | 52 | 67 | 0 | 755 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 1.9 | 0.0 | 7.6 | 4.0 | 0.0 | 19.9 | 10.1 | 0.0 | 11.7 | 3.8 | 0.0 | 5.0 | 6.6 | 0.0 | 73.4 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 4.7 | 4.7 | 12.3 | 16.3 | 16.3 | 36.2 | 46.3 | 46.3 | 58.0 | 61.8 | 61.8 | 66.8 | 73.4 | 73.4 | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 13 | 0 | 53 | 80 | 0 | 132 | 165 | 0 | 115 | 136 | 0 | 26 | 163 | 0 | 910 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 13 | 0 | 53 | 80 | 0 | 135 | 165 | 0 | 116 | 136 | 0 | 26 | 163 | 0 | 914 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 1.3 | 0.0 | 5.3 | 8.0 | 0.0 | 13.2 | 16.5 | 0.0 | 11.5 | 13.6 | 0.0 | 2.6 | 16.3 | 0.0 | 91.0 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 4.0 | 4.0 | 9.3 | 17.3 | 17.3 | 30.5 | 47.0 | 47.0 | 58.5 | 72.1 | 72.1 | 74.7 | 91.0 | 91.0 | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 52 | 0 | 112 | 36 | 0 | 159 | 116 | 0 | 99 | 101 | 0 | 30 | 109 | 0 | 827 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 7 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 52 | 0 | 112 | 36 | 0 | 163 | 116 | 0 | 100 | 102 | 0 | 30 | 110 | 0 | 834 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 5.2 | 0.0 | 11.2 | 3.6 | 0.0 | 15.9 | 11.6 | 0.0 | 9.9 | 10.1 | 0.0 | 3.0 | 10.9 | 0.0 | 82.7 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 6.5 | 6.5 | 17.7 | 21.3 | 21.3 | 37.2 | 48.8 | 48.8 | 58.7 | 68.8 | 68.8 | 71.8 | 82.7 | 82.7 | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₀ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 14 | 0 | 32 | 50 | 0 | 139 | 153 | 0 | 85 | 146 | 0 | 0 | 88 | 9 | 741 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| | F ₁ generation | Total | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 14 | 0 | 32 | 51 | 0 | 139 | 154 | 0 | 86 | 147 | 0 | 0 | 88 | 9 | 745 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 1.4 | 0.0 | 3.2 | 5.0 | 0.0 | 13.9 | 15.3 | 0.0 | 8.5 | 14.6 | 0.0 | 0.0 | 8.8 | 0.9 | 74.1 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 3.9 | 3.9 | 7.1 | 12.1 | 12.1 | 26.0 | 41.3 | 41.3 | 49.8 | 64.4 | 64.4 | 64.4 | 73.2 | 74.1 | |

Appendix 3-4. Result of reproduction test

(Nominal concentration : 0.250 mg/L)

| | | | (Nominal concentration : 0.250 mg/L) | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---------------------------|------|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Rep. No | Counts | | Time | | | | | | | | | | | | | | | | | | | | | Total |
| | | | 4/1 | 4/2 | 4/3 | 4/4 | 4/5 | 4/6 | 4/7 | 4/8 | 4/9 | 4/10 | 4/11 | 4/12 | 4/13 | 4/14 | 4/15 | 4/16 | 4/17 | 4/18 | 4/19 | 4/20 | 4/21 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 22 | 0 | 62 | 16 | 0 | 114 | 181 | 0 | 86 | 170 | 1 | 32 | 104 | 0 | 801 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 4 | 0 | 13 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 22 | 0 | 64 | 18 | 0 | 115 | 183 | 0 | 86 | 172 | 1 | 32 | 108 | 0 | 814 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 2.2 | 0.0 | 6.2 | 1.6 | 0.0 | 11.4 | 18.1 | 0.0 | 8.6 | 17.0 | 0.1 | 3.2 | 10.4 | 0.0 | 80.1 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 3.5 | 3.5 | 9.7 | 11.3 | 11.3 | 22.7 | 40.8 | 40.8 | 49.4 | 66.4 | 66.5 | 69.7 | 80.1 | 80.1 | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 17 | 0 | 32 | 30 | 0 | 95 | 157 | 0 | 64 | 163 | 0 | 0 | 118 | 8 | 705 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 5 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 17 | 0 | 32 | 31 | 0 | 95 | 157 | 0 | 64 | 165 | 0 | 0 | 120 | 8 | 710 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 1.7 | 0.0 | 3.2 | 3.0 | 0.0 | 9.5 | 15.7 | 0.0 | 6.4 | 16.3 | 0.0 | 0.0 | 13.1 | 0.9 | 71.9 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 3.8 | 3.8 | 7.0 | 10.0 | 10.0 | 19.5 | 35.2 | 35.2 | 41.6 | 57.9 | 57.9 | 57.9 | 71.0 | 71.9 | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 23 | 0 | 47 | 81 | 0 | 194 | 58 | 0 | 207 | 58 | 0 | 35 | 55 | 0 | 763 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 2 | 1 | 0 | 10 | 0 | 0 | 0 | 2 | 0 | 20 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 24 | 0 | 51 | 81 | 0 | 196 | 59 | 0 | 217 | 58 | 0 | 35 | 57 | 0 | 783 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 2.3 | 0.0 | 4.7 | 8.1 | 0.0 | 19.4 | 6.1 | 0.0 | 23.0 | 6.4 | 0.0 | 3.9 | 6.1 | 0.0 | 80.5 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 2.8 | 2.8 | 7.5 | 15.6 | 15.6 | 35.0 | 41.1 | 41.1 | 64.1 | 70.5 | 70.5 | 74.4 | 80.5 | 80.5 | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 16 | 0 | 94 | 22 | 0 | 218 | 67 | 0 | 208 | 75 | 0 | 33 | 84 | 0 | 836 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 4 | 0 | 1 | 7 | 0 | 15 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 16 | 0 | 94 | 22 | 0 | 219 | 67 | 0 | 210 | 79 | 0 | 34 | 91 | 0 | 851 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 1.6 | 0.0 | 9.4 | 2.2 | 0.0 | 21.8 | 6.7 | 0.0 | 20.8 | 7.5 | 0.0 | 3.3 | 8.4 | 0.0 | 83.6 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 3.5 | 3.5 | 12.9 | 15.1 | 15.1 | 36.9 | 43.6 | 43.6 | 64.4 | 71.9 | 71.9 | 75.2 | 83.6 | 83.6 | |

Appendix 3-5. Result of reproduction test

(Nominal concentration : 0.791 mg/L)

| | | | (Nominal concentration : 0.791 mg/L) | | | | | | | | | | Time | | | | | | | | | | | Total |
|---------------------------|---------------------------|------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Rep. No | Counts | | 4/1 | 4/2 | 4/3 | 4/4 | 4/5 | 4/6 | 4/7 | 4/8 | 4/9 | 4/10 | 4/11 | 4/12 | 4/13 | 4/14 | 4/15 | 4/16 | 4/17 | 4/18 | 4/19 | 4/20 | 4/21 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 2 | 0 | 31 | 32 | 0 | 135 | 107 | 0 | 131 | 141 | 0 | 7 | 245 | 0 | 848 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 2 | 0 | 32 | 34 | 0 | 137 | 108 | 0 | 131 | 141 | 0 | 7 | 245 | 0 | 854 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 0.2 | 0.0 | 3.1 | 3.2 | 0.0 | 13.5 | 10.7 | 0.0 | 13.1 | 14.1 | 0.0 | 0.7 | 24.5 | 0.0 | 84.8 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 1.9 | 1.9 | 5.0 | 8.2 | 8.2 | 21.7 | 32.4 | 32.4 | 45.5 | 59.6 | 59.6 | 60.3 | 84.8 | 84.8 | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 22 | 0 | 48 | 36 | 0 | 132 | 139 | 0 | 22 | 144 | 0 | 25 | 207 | 0 | 788 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 12 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 22 | 0 | 49 | 36 | 0 | 137 | 140 | 0 | 27 | 144 | 0 | 25 | 207 | 0 | 800 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 2.2 | 0.0 | 4.8 | 3.6 | 0.0 | 13.2 | 13.9 | 0.0 | 2.2 | 14.4 | 0.0 | 2.5 | 20.7 | 0.0 | 78.8 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 3.5 | 3.5 | 8.3 | 11.9 | 11.9 | 25.1 | 39.0 | 39.0 | 41.2 | 55.6 | 55.6 | 58.1 | 78.8 | 78.8 | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 15 | 0 | 50 | 2 | 0 | 182 | 114 | 0 | 150 | 124 | 0 | 66 | 166 | 0 | 890 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 4 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 15 | 0 | 51 | 2 | 0 | 183 | 114 | 0 | 150 | 125 | 0 | 66 | 167 | 0 | 894 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 1.5 | 0.0 | 5.0 | 0.2 | 0.0 | 18.2 | 11.4 | 0.0 | 15.0 | 12.4 | 0.0 | 6.6 | 16.6 | 0.0 | 89.0 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 3.6 | 3.6 | 8.6 | 8.8 | 8.8 | 27.0 | 38.4 | 38.4 | 53.4 | 65.8 | 65.8 | 72.4 | 89.0 | 89.0 | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 8 | 8 | 8 | 8 | 6 | 5 | 0 | 0 | 0 | 0 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 4 | 5 | 10 | 10 | 10 | 10 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 5 | 0 | 24 | 5 | 0 | 57 | 37 | 1 | 123 | 2 | 0 | 0 | 0 | 0 | 268 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 49 | 15 | 0 | 2 | 14 | 0 | 0 | 0 | 0 | 84 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 5 | 0 | 27 | 5 | 0 | 106 | 52 | 1 | 125 | 16 | 0 | 0 | 0 | 0 | 352 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.5 | 0.0 | 2.4 | 0.6 | 0.0 | 7.1 | 4.6 | 0.1 | 17.6 | 0.3 | - | - | - | - | 34.6 |
| Cumulative reproductivity | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 1.9 | 1.9 | 4.3 | 4.9 | 4.9 | 12.0 | 16.6 | 16.7 | 34.3 | 34.6 | 34.6 | 34.6 | 34.6 | 34.6 | |

Appendix 3-6. Result of reproduction test

(Nominal concentration : 2.50 mg/L)

| | | | (Nominal concentration : 2.50 mg/L) | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---------------------------|------|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Rep. No | Counts | | Time | | | | | | | | | | | | | | | | | | | | | Total |
| | | | 4/1 | 4/2 | 4/3 | 4/4 | 4/5 | 4/6 | 4/7 | 4/8 | 4/9 | 4/10 | 4/11 | 4/12 | 4/13 | 4/14 | 4/15 | 4/16 | 4/17 | 4/18 | 4/19 | 4/20 | 4/21 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 20 | 75 | 0 | 0 | 214 | 0 | 0 | 218 | 0 | 0 | 202 | 19 | 756 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 6 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 20 | 75 | 0 | 0 | 218 | 0 | 0 | 220 | 0 | 0 | 202 | 19 | 762 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 2.0 | 7.5 | 0.0 | 0.0 | 23.8 | 0.0 | 0.0 | 24.2 | 0.0 | 0.0 | 22.4 | 2.1 | 82.9 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.8 | 2.8 | 10.3 | 10.3 | 10.3 | 34.1 | 34.1 | 34.1 | 58.3 | 58.3 | 58.3 | 80.7 | 82.9 | | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 8 | 0 | 51 | 5 | 0 | 70 | 78 | 0 | 114 | 72 | 1 | 0 | 192 | 0 | 596 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 21 | 12 | 0 | 4 | 7 | 0 | 0 | 2 | 0 | 50 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 9 | 0 | 52 | 7 | 0 | 91 | 90 | 0 | 118 | 79 | 1 | 0 | 194 | 0 | 646 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.9 | 0.0 | 5.7 | 0.6 | 0.0 | 7.8 | 8.7 | 0.0 | 12.7 | 8.0 | 0.1 | 0.0 | 21.3 | 0.0 | 66.2 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 1.4 | 1.4 | 7.1 | 7.7 | 7.7 | 15.4 | 24.1 | 24.1 | 36.8 | 44.8 | 44.9 | 44.9 | 66.2 | 66.2 | | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 12 | 0 | 44 | 45 | 0 | 84 | 73 | 0 | 111 | 133 | 7 | 51 | 150 | 32 | 761 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 19 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 35 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 12 | 0 | 50 | 46 | 0 | 103 | 79 | 0 | 111 | 133 | 7 | 51 | 153 | 32 | 796 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 1.2 | 0.0 | 4.4 | 4.5 | 0.0 | 8.4 | 7.3 | 0.0 | 11.1 | 13.3 | 0.7 | 5.1 | 15.0 | 3.2 | 76.1 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 3.1 | 3.1 | 7.5 | 12.0 | 12.0 | 20.4 | 27.7 | 27.7 | 38.8 | 52.1 | 52.8 | 57.9 | 72.9 | 76.1 | | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 8 | 8 | 8 | 5 | 5 | 5 | 5 | 5 | 5 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 13 | 0 | 38 | 15 | 0 | 15 | 20 | 0 | 15 | 23 | 0 | 23 | 61 | 0 | 235 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 61 | 25 | 0 | 21 | 33 | 0 | 0 | 1 | 0 | 143 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 13 | 0 | 40 | 15 | 0 | 76 | 45 | 0 | 36 | 56 | 0 | 23 | 62 | 0 | 378 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 1.3 | 0.0 | 3.8 | 1.7 | 0.0 | 1.9 | 2.4 | 0.0 | 2.3 | 3.5 | 0.0 | 4.6 | 12.2 | 0.0 | 34.8 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.5 | 2.5 | 6.3 | 8.0 | 8.0 | 9.8 | 12.2 | 12.2 | 14.5 | 18.0 | 18.0 | 22.6 | 34.8 | 34.8 | | |

(Nominal concentration : 7.91 mg/L)

[illegible]

Appendix 3-8. Result of reproduction test

(Nominal concentration : 25.0 mg/L)

[illegible]

追加資料－ 1

別途実施のミジンコ繁殖阻害試験の観察結果

(全 17 頁)

[Supplement]

Table 1. Concentrations of dichlorobromomethane in reproduction test using *Daphnia magna* under semi-static conditions

| Nominal concentration (mg/L) | Observed concentration (mg/L) | | Geometric mean (mg/L) | Observed concentration (mg/L) | | Geometric mean (mg/L) |
|---------------------------------|----------------------------------|---------------------|--------------------------|----------------------------------|---------------------|--------------------------|
| | 0-day ^{a)} | 1 day ^{b)} | | 7-day ^{a)} | 8-day ^{b)} | |
| Control | 0 | 0 | - | 0 | 0 | - |
| 1.88 | 1.62 (86.4) | 1.43 (76.2) | 1.53 (81.4) | 1.53 (1.53) | 1.44 (1.44) | 1.48 (103) |
| 3.75 | 3.40 (90.7) | 3.01 (80.3) | 3.20 (85.3) | 3.31 (3.31) | 3.02 (3.02) | 3.16 (105) |
| 7.50 | 6.29 (83.8) | 5.52 (73.6) | 5.90 (78.7) | 6.12 (6.12) | 5.54 (5.54) | 5.83 (106) |
| 15.0 | 13.5 (90.1) | 12.1 (80.9) | 12.8 (85.3) | 13.1 (13.1) | 12.0 (12.0) | 12.5 (103) |
| 30 | 28.1 (93.8) | 24.2 (80.5) | 26.1 (87.0) | 26.9 (26.9) | 23.9 (23.9) | 25.4 (105) |

Table 1. (Continued)

| Nominal concentration (mg/L) | Observed concentration (mg/L) | | Geometric mean (mg/L) | Time-weighted mean (mg/L) |
|---------------------------------|----------------------------------|----------------------|--------------------------|------------------------------|
| | 14-day ^{a)} | 15-day ^{b)} | | |
| Control | 0 | 0 | - | - |
| 1.88 | 1.65 (88.0) | 1.57 (83.6) | 1.61 (85.6) | 1.54 (82.0) |
| 3.75 | 3.40 (90.6) | 2.99 (79.8) | 3.19 (85.1) | 3.18 (84.8) |
| 7.50 | 6.32 (84.2) | 5.91 (78.7) | 6.11 (81.5) | 5.95 (79.4) |
| 15.0 | 13.6 (90.4) | 12.4 (82.5) | 13.0 (86.7) | 12.8 (85.1) |
| 30 | 28.2 (93.9) | 25.3 (84.2) | 26.7 (89.0) | 26.1 (86.9) |

Value of parethese are percent of nominal

a) fresh solutions

b) expired solutions

c) The values are expressed as time-weighted means calculated by the following equation:

$$((C_0 - C_1)/(\ln C_0 - \ln C_1) + (C_7 - C_8)/(\ln C_7 - \ln C_8) + (C_{14} - C_{15})/(\ln C_{14} - \ln C_{15}))/3$$

where

Cx : the observed concentration at x-day

lnCx : the natural logarithm of Cx

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Table 2. Cumulative number of dead parental *Daphnia* during exposure to dichlorobromomethane

| Concentration (mg/L) | Exposure time (day) | | | | | | | | | | |
|-------------------------|---------------------|------|------|-------|--------|--------|--------|--------|--------|--------|--------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 1.88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 3.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 7.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 15.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 30 | 0 | 0 | 0 | 1 | 12 | 13 | 15 | 17 | 20 | 28 | 32 |
| | (0) | (0) | (0) | (2.5) | (30.0) | (32.5) | (37.5) | (42.5) | (50.0) | (70.0) | (80.0) |

Table 2. (continued)

| Concentration (mg/L) | Exposure time (day) | | | | | | | | | | |
|-------------------------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| Control | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 |
| | (0) | (0) | (0) | (0) | (0) | (2.5) | (2.5) | (2.5) | (2.5) | (5.0) | (5.0) |
| 1.88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 3.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 7.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 15.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 30 | 33 | 33 | 34 | 34 | 35 | 35 | 35 | 35 | 35 | 37 | 38 |
| | (82.5) | (82.5) | (85.0) | (85.0) | (87.5) | (87.5) | (87.5) | (87.5) | (87.5) | (92.5) | (95.0) |

The values in parentheses express mortality (%) of *Daphnia*.

[Supplement]

Table 3. Time (days) required to first brood production during exposure to dichlorobromomethane

| Concentration (mg/L) | Vessel No. | | | | Mean |
|-------------------------|------------|----|----|----|------|
| | 1 | 2 | 3 | 4 | |
| Control | 7 | 7 | 7 | 7 | 7.0 |
| 1.88 | 7 | 7 | 7 | 7 | 7.0 |
| 3.75 | 7 | 7 | 7 | 7 | 7.0 |
| 7.50 | 9 | 10 | 10 | 10 | 9.8 |
| 15.0 | 7 | 7 | 7 | 8 | 7.3 |
| 30 | - | - | - | - | - |

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Table 4. Mean cumulative number of juveniles produced per adult ($\Sigma F_1/P$) during exposure to dichlorobromomethane

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Table 4. (continued)

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Table 5. Calculated LC50 values of dichlorobromomethane for parental *Daphnia* based on observed concentrations

| Exposure time (day) | LC50 (mg/L) | 95-Percent confidence limits (mg/L) | Statistical method |
|------------------------|----------------|---|-----------------------|
| 1 | > 30 | - ~ - | - |
| 2 | > 30 | - ~ - | - |
| 4 | > 30 | - ~ - | - |
| 7 | > 30 | - ~ - | - |
| 14 | >30 | - ~ - | - |
| 21 | >30 | - ~ - | - |

Table 6. Calculated ErC50 values of dichlorobromomethane for inhibition of reproduction based on observed concentrations

| Exposure time (day) | ErC50 (mg/L) | 95-Percent confidence limits (mg/L) | Statistical method |
|------------------------|-----------------|---|-----------------------|
| 14 | 3.71 | 3.20 ~ 4.30 | moving average |
| 21 | 4.01 | 2.42 ~ 7.44 | moving average |

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Table 7. Significance test of difference between the mean cumulative numbers of juveniles produced per adult in control and test vessels after 21 days exposure to dichlorobromomethane

| Concentration (mg/L) | Vessel No. | | | | Mean | S.D. | Significant difference |
|-------------------------|------------|------|------|------|------|------|---------------------------|
| | 1 | 2 | 3 | 4 | | | |
| Control | 102 | 106 | 98.4 | 103 | 102 | 3.3 | |
| 1.88 | 77.2 | 79.9 | 70.1 | 75.4 | 75.7 | 4.14 | ** |
| 3.75 | 70.5 | 61.8 | 61.6 | 70.4 | 66.1 | 5.05 | ** |
| 7.50 | 5.5 | 15.1 | 18.1 | 8.2 | 11.7 | 5.87 | ** |
| 15.0 | 0.9 | 1.1 | 2.6 | 1.6 | 1.6 | 0.76 | - |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | - |

The data of 15.0 and 30 mg/L were omitted from statistical analysis.

No observed effect concentration (NOECr) < 1.88 mg/L

Lowest effect concentration (LOECr) < 1.88 mg/L

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Table 8. Temperature of media during 21day *Daphnia* reproduction inhibition test to dichlorobromomethane

| Nominal concentration (mg/L) | | Temperature (°C) | | | | | | | | | | |
|------------------------------------|-----|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | 0-day | 1-day | 2-day | 3-day | 4-day | 5-day | 6-day | 7-day | 8-day | 9-day | 10-day |
| Control | New | 19.9 | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| | Old | | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| 1.88 | New | 19.9 | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| | Old | | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| 3.75 | New | 19.9 | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| | Old | | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| 7.50 | New | 19.9 | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| | Old | | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| 15.0 | New | 19.9 | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| | Old | | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| 30 | New | 19.9 | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |
| | Old | | 19.9 | 19.9 | 19.9 | 19.7 | 20.1 | 20.5 | 20.3 | 20.2 | 20.0 | 20.0 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

Table 8. (continued)

| Nominal concentration (mg/L) | | Temperature (°C) | | | | | | | | | | |
|------------------------------------|-----|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 11-day | 12-day | 13-day | 14-day | 15-day | 16-day | 17-day | 18-day | 19-day | 20-day | 21-day |
| Control | New | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.3 | |
| | Old | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.7 | 19.5 |
| 1.88 | New | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.5 | |
| | Old | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.7 | 19.6 |
| 3.75 | New | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.5 | |
| | Old | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.7 | 19.6 |
| 7.50 | New | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.5 | |
| | Old | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.7 | 19.6 |
| 15.0 | New | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.5 | |
| | Old | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.7 | 19.6 |
| 30 | New | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.5 | |
| | Old | 20.0 | 19.9 | 19.9 | 19.9 | 19.9 | 20.0 | 20.0 | 19.9 | 20.0 | 19.6 | 19.6 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

[Supplement]

Table 9. Dissolved oxygen concentrations of media during 21day *Daphnia* reproduction inhibition test to dichlorobromomethane

| Nominal concentration (mg/L) | | Dissolved oxygen concentration (mg/L) | | | | | | | | | | |
|------------------------------|-----|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | 0-day | 1-day | 2-day | 3-day | 4-day | 5-day | 6-day | 7-day | 8-day | 9-day | 10-day |
| Control | New | 8.9 | 8.8 | 8.9 | 9.0 | 9.0 | 8.6 | 8.6 | 9.0 | 8.9 | 9.0 | 8.8 |
| | Old | | 8.9 | 9.4 | 9.0 | 8.9 | 7.7 | 8.1 | 8.0 | 8.0 | 7.9 | 7.8 |
| 1.88 | New | 8.8 | 8.8 | 8.9 | 9.0 | 9.0 | 8.6 | 8.6 | 9.0 | 8.9 | 8.9 | 8.8 |
| | Old | | 9.2 | 9.5 | 9.1 | 8.9 | 7.5 | 8.2 | 7.7 | 8.3 | 8.1 | 7.9 |
| 3.75 | New | 8.9 | 8.8 | 8.9 | 9.0 | 9.0 | 8.6 | 8.5 | 8.9 | 8.9 | 9.0 | 8.8 |
| | Old | | 9.4 | 9.5 | 9.1 | 8.9 | 6.7 | 8.3 | 7.5 | 8.2 | 8.0 | 7.8 |
| 7.50 | New | 8.9 | 8.8 | 8.9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.9 | 8.9 | 8.9 | 8.8 |
| | Old | | 9.4 | 9.5 | 9.1 | 8.9 | 7.3 | 8.5 | 7.8 | 8.2 | 8.0 | 7.9 |
| 15.0 | New | 8.9 | 8.8 | 8.9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.9 | 8.9 | 9.0 | 8.8 |
| | Old | | 9.4 | 9.4 | 9.1 | 8.9 | 7.1 | 8.5 | 7.8 | 8.6 | 8.4 | 8.1 |
| 30 | New | 8.8 | 8.8 | 8.9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.9 | 8.8 | 9.0 | 8.8 |
| | Old | | 9.1 | 9.4 | 9.1 | 8.9 | 7.6 | 8.9 | 8.2 | 8.5 | 8.8 | 8.6 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

Table 9. (continued)

| Nominal concentration (mg/L) | | Dissolved oxygen concentration (mg/L) | | | | | | | | | | |
|------------------------------|-----|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 11-day | 12-day | 13-day | 14-day | 15-day | 16-day | 17-day | 18-day | 19-day | 20-day | 21-day |
| Control | New | 8.9 | 8.9 | 8.9 | 8.9 | 9.0 | 8.9 | 8.9 | 8.8 | 8.8 | 8.8 | |
| | Old | 8.1 | 7.9 | 7.6 | 7.4 | 7.6 | 7.0 | 7.7 | 7.5 | 7.3 | 7.6 | 7.0 |
| 1.88 | New | 8.9 | 8.9 | 8.9 | 9.0 | 8.9 | 8.9 | 8.9 | 8.8 | 8.8 | 8.8 | |
| | Old | 8.2 | 8.0 | 7.7 | 7.0 | 7.5 | 7.1 | 7.8 | 7.7 | 7.6 | 7.7 | 7.6 |
| 3.75 | New | 8.9 | 9.0 | 8.9 | 9.0 | 8.9 | 8.9 | 9.0 | 8.8 | 8.8 | 8.8 | |
| | Old | 7.8 | 7.8 | 7.6 | 7.0 | 7.3 | 7.0 | 7.5 | 7.5 | 7.5 | 7.7 | 7.6 |
| 7.50 | New | 9.0 | 8.9 | 8.9 | 8.9 | 9.0 | 8.8 | 8.9 | 8.8 | 8.8 | 8.8 | |
| | Old | 8.1 | 8.0 | 8.0 | 7.6 | 7.6 | 7.5 | 6.8 | 7.7 | 7.9 | 8.1 | 8.1 |
| 15.0 | New | 8.9 | 9.0 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.8 | 8.8 | 8.8 | |
| | Old | 8.3 | 8.3 | 8.3 | 8.1 | 8.2 | 8.0 | 7.9 | 8.2 | 8.5 | 8.6 | 8.3 |
| 30 | New | 8.9 | 9.0 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.8 | 8.9 | 8.8 | |
| | Old | 8.7 | 8.7 | 8.6 | 8.6 | 8.5 | 8.7 | 8.4 | 8.8 | 9.0 | 9.0 | 9.0 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

[Supplement]

Table 10. pH values of media during 21day *Daphnia* reproduction inhibition test to dichlorobromomethane

| Nominal concentration (mg/L) | pH | | | | | | | | | | | |
|------------------------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | 0-day | 1-day | 2-day | 3-day | 4-day | 5-day | 6-day | 7-day | 8-day | 9-day | 10-day |
| Control | New | 7.45 | 7.34 | 7.53 | 7.76 | 7.72 | 7.86 | 7.62 | 7.69 | 7.73 | 7.66 | 7.80 |
| | Old | | 7.68 | 7.84 | 7.53 | 7.65 | 7.45 | 7.56 | 7.47 | 7.45 | 7.53 | 7.39 |
| 1.88 | New | 7.51 | 7.41 | 7.42 | 7.68 | 7.82 | 7.86 | 7.62 | 7.67 | 7.72 | 7.66 | 7.82 |
| | Old | | 7.74 | 7.74 | 7.55 | 7.64 | 7.41 | 7.53 | 7.35 | 7.44 | 7.53 | 7.34 |
| 3.75 | New | 7.56 | 7.44 | 7.45 | 7.68 | 7.80 | 7.82 | 7.62 | 7.64 | 7.73 | 7.63 | 7.81 |
| | Old | | 7.72 | 7.67 | 7.54 | 7.64 | 7.30 | 7.53 | 7.33 | 7.45 | 7.52 | 7.31 |
| 7.50 | New | 7.61 | 7.49 | 7.49 | 7.76 | 7.82 | 7.84 | 7.64 | 7.60 | 7.74 | 7.62 | 7.79 |
| | Old | | 7.75 | 7.63 | 7.34 | 7.64 | 7.40 | 7.53 | 7.36 | 7.40 | 7.52 | 7.35 |
| 15.0 | New | 7.63 | 7.57 | 7.58 | 7.78 | 7.82 | 7.84 | 7.71 | 7.61 | 7.76 | 7.60 | 7.77 |
| | Old | | 7.71 | 7.67 | 7.50 | 7.64 | 7.38 | 7.53 | 7.40 | 7.48 | 7.59 | 7.36 |
| 30 | New | 7.63 | 7.63 | 7.42 | 7.80 | 7.82 | 7.87 | 7.86 | 7.60 | 7.76 | 7.64 | 7.73 |
| | Old | | 7.67 | 7.71 | 7.41 | 7.64 | 7.50 | 7.52 | 7.44 | 7.50 | 7.72 | 7.50 |

new : freshly prepared test solutions

old : test solutions after 24 hours exposure

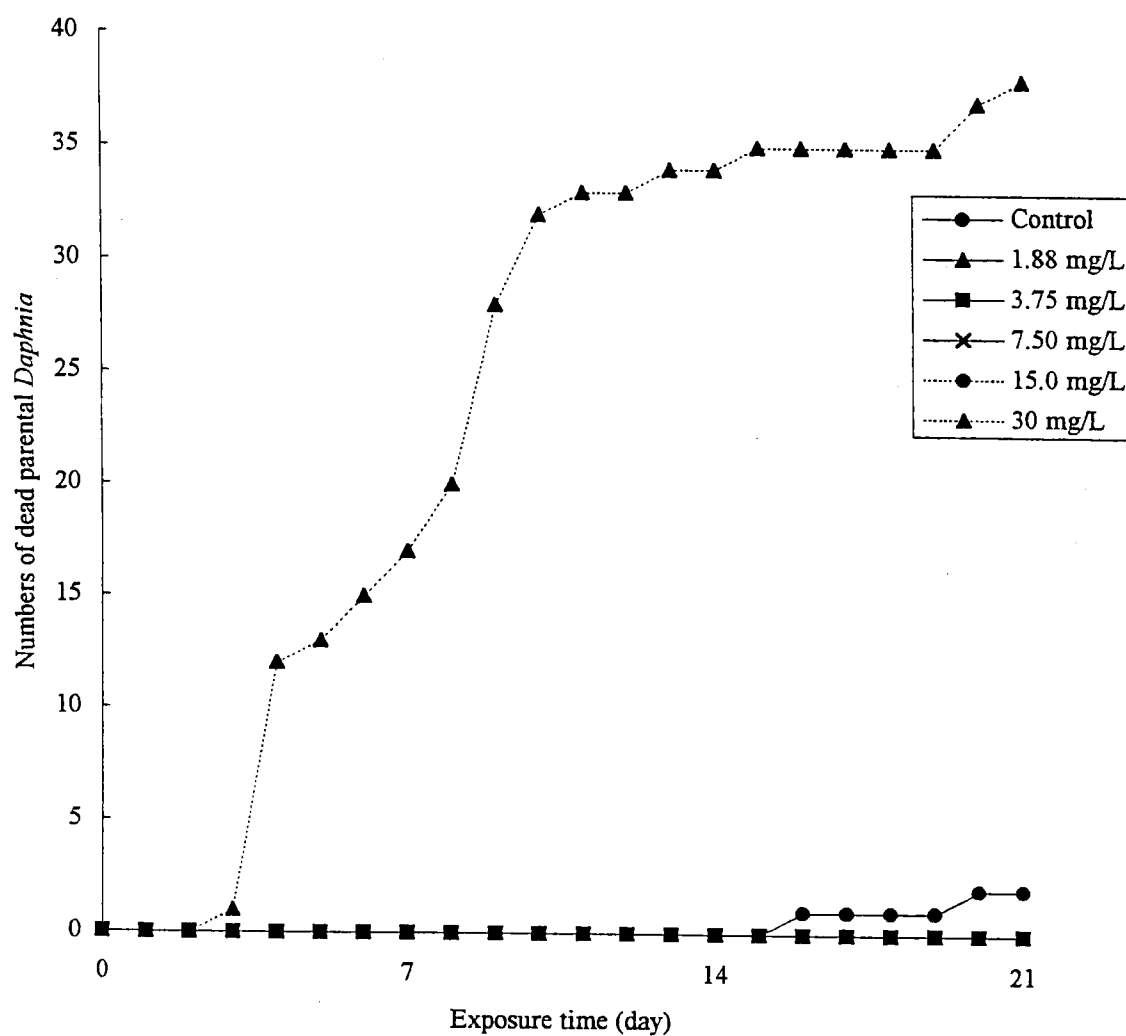
Table 10. (continued)

| Nominal concentration (mg/L) | pH | | | | | | | | | | | |
|------------------------------------|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 11-day | 12-day | 13-day | 14-day | 15-day | 16-day | 17-day | 18-day | 19-day | 20-day | 21-day |
| Control | New | 7.89 | 7.60 | 7.50 | 7.65 | 7.52 | 7.63 | 7.48 | 7.63 | 7.26 | 7.49 | |
| | Old | 7.55 | 7.46 | 7.29 | 7.31 | 7.37 | 7.44 | 7.53 | 7.71 | 7.22 | 7.37 | 7.16 |
| 1.88 | New | 7.86 | 7.57 | 7.49 | 7.67 | 7.55 | 7.62 | 7.60 | 7.70 | 7.37 | 7.54 | |
| | Old | 7.46 | 7.41 | 7.26 | 7.27 | 7.33 | 7.33 | 7.53 | 7.50 | 7.28 | 7.34 | 7.21 |
| 3.75 | New | 7.83 | 7.59 | 7.49 | 7.64 | 7.59 | 7.62 | 7.60 | 7.73 | 7.41 | 7.57 | |
| | Old | 7.42 | 7.40 | 7.26 | 7.25 | 7.29 | 7.27 | 7.33 | 7.56 | 7.30 | 7.35 | 7.21 |
| 7.50 | New | 7.83 | 7.58 | 7.51 | 7.64 | 7.56 | 7.64 | 7.65 | 7.76 | 7.43 | 7.59 | |
| | Old | 7.46 | 7.43 | 7.29 | 7.30 | 7.27 | 7.25 | 7.38 | 7.50 | 7.33 | 7.38 | 7.28 |
| 15.0 | New | 7.82 | 7.58 | 7.53 | 7.64 | 7.56 | 7.62 | 7.68 | 7.79 | 7.45 | 7.59 | |
| | Old | 7.50 | 7.49 | 7.37 | 7.41 | 7.32 | 7.39 | 7.37 | 7.58 | 7.44 | 7.44 | 7.35 |
| 30 | New | 7.82 | 7.60 | 7.55 | 7.63 | 7.59 | 7.62 | 7.68 | 7.77 | 7.48 | 7.59 | |
| | Old | 7.72 | 7.67 | 7.52 | 7.56 | 7.46 | 7.53 | 7.47 | 7.78 | 7.72 | 7.53 | 7.47 |

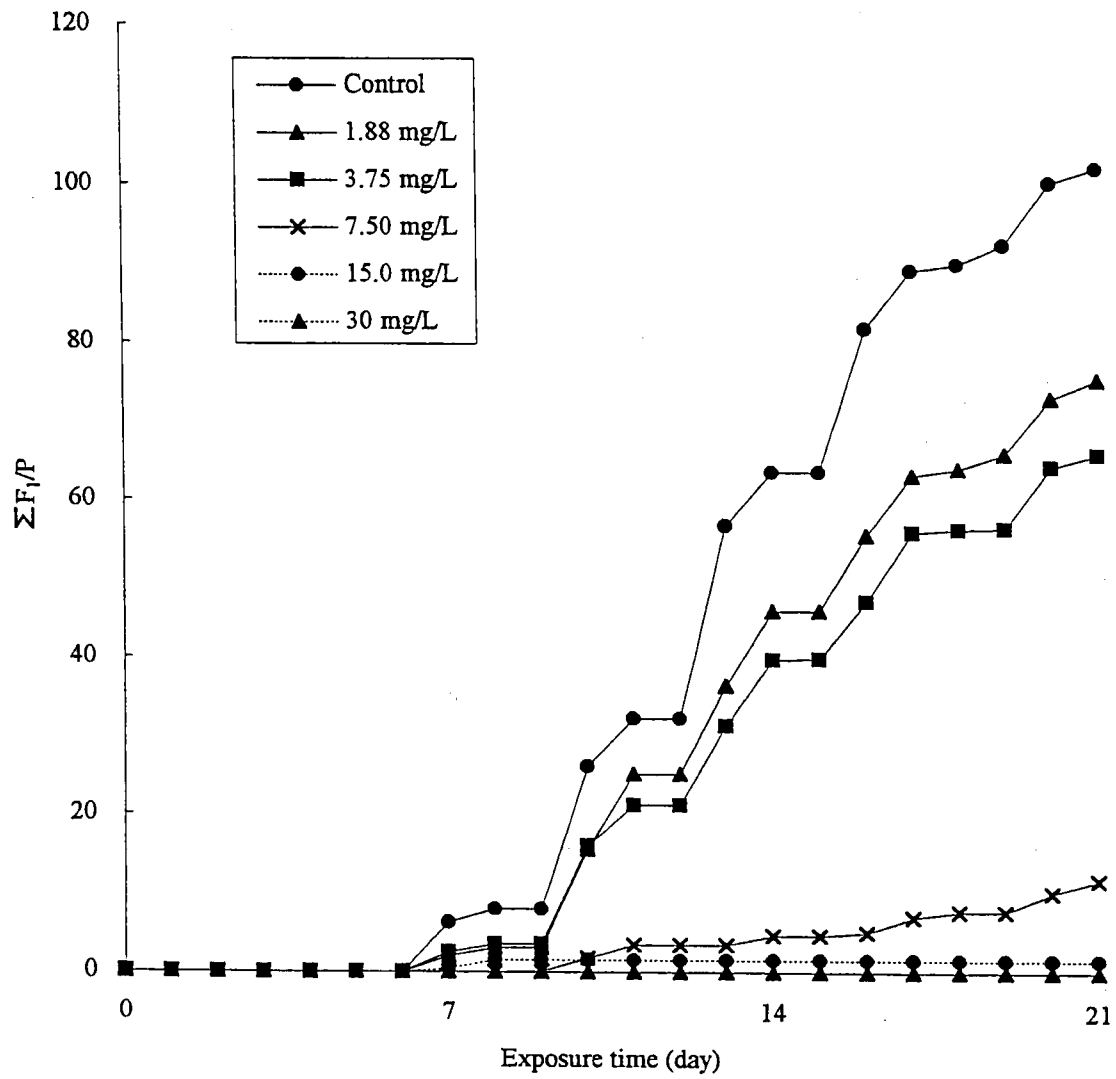
new : freshly prepared test solutions

old : test solutions after 24 hours exposure

[Supplement]

Figure 1. Cumulative numbers of dead parental *Daphnia*.

[Supplement]

Figure 2. Mean cumulative numbers of juveniles produced per adult ($\Sigma F_1/P$).

Supplement 1-1. Result of previous reproduction test

(Nominal concentration : Control)

| | | | (Nominal concentration : Control) | | | | | | | | | | Time | | | | | | | | | | | Total |
|---------------------------|---------------------------|------|-------------------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|------|-------|
| Rep. No | Counts | | 2/8 | 2/9 | 2/10 | 2/11 | 2/12 | 2/13 | 2/14 | 2/15 | 2/16 | 2/17 | 2/18 | 2/19 | 2/20 | 2/21 | 2/22 | 2/23 | 2/24 | 2/25 | 2/26 | 2/27 | 2/28 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 16 | 0 | 210 | 34 | 0 | 296 | 38 | 0 | 217 | 53 | 0 | 42 | 24 | 19 | 1019 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 2 | 0 | 7 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 16 | 0 | 210 | 34 | 0 | 296 | 38 | 0 | 221 | 53 | 0 | 43 | 26 | 19 | 1026 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 1.6 | 0.0 | 21.0 | 3.4 | 0.0 | 29.6 | 3.8 | 0.0 | 21.7 | 5.3 | 0.0 | 4.2 | 2.4 | 1.9 | 101.9 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 8.6 | 8.6 | 29.6 | 33.0 | 33.0 | 62.6 | 66.4 | 66.4 | 88.1 | 93.4 | 93.4 | 97.6 | 100.0 | 101.9 | | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 8 | 8 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 7 | 0 | 224 | 37 | 0 | 261 | 33 | 0 | 191 | 53 | 0 | 18 | 124 | 0 | 1017 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 71 | 7 | 0 | 224 | 37 | 0 | 263 | 33 | 0 | 192 | 53 | 0 | 18 | 124 | 0 | 1022 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 | 0.7 | 0.0 | 22.4 | 3.7 | 0.0 | 26.1 | 3.3 | 0.0 | 20.1 | 5.6 | 0.0 | 2.0 | 15.5 | 0.0 | 106.3 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 | 7.6 | 7.6 | 30.0 | 33.7 | 33.7 | 59.8 | 63.1 | 63.1 | 83.2 | 88.8 | 88.8 | 90.8 | 106.3 | 106.3 | | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 29 | 0 | 117 | 84 | 0 | 209 | 120 | 0 | 169 | 83 | 17 | 22 | 50 | 19 | 984 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 9 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 29 | 0 | 121 | 84 | 0 | 209 | 120 | 0 | 172 | 84 | 17 | 22 | 51 | 19 | 993 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 2.9 | 0.0 | 11.7 | 8.4 | 0.0 | 20.9 | 12.0 | 0.0 | 16.9 | 8.3 | 1.7 | 2.2 | 5.0 | 1.9 | 98.4 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 9.4 | 9.4 | 21.1 | 29.5 | 29.5 | 50.4 | 62.4 | 62.4 | 79.3 | 87.6 | 89.3 | 91.5 | 96.5 | 98.4 | | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 15 | 0 | 177 | 90 | 0 | 217 | 84 | 0 | 146 | 101 | 14 | 15 | 88 | 36 | 1030 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 2 | 1 | 0 | 0 | 0 | 9 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 16 | 0 | 177 | 90 | 0 | 218 | 84 | 0 | 149 | 103 | 15 | 15 | 88 | 36 | 1039 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.7 | 1.5 | 0.0 | 17.7 | 9.0 | 0.0 | 21.7 | 8.4 | 0.0 | 14.6 | 10.1 | 1.4 | 1.5 | 8.8 | 3.6 | 103.0 |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.7 | 6.2 | 6.2 | 23.9 | 32.9 | 32.9 | 54.6 | 63.0 | 63.0 | 77.6 | 87.7 | 89.1 | 90.6 | 99.4 | 103.0 | | |

Supplement 1-2. Result of previous reproduction test

(Nominal concentration : 1.88 mg/L)

| | | (Nominal concentration : 1.88 mg/L) | | | | | | | | | | Time | | | | | | | | | | | Total | |
|---------|---------------------------|---------------------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|
| Rep. No | Counts | 2/8 | 2/9 | 2/10 | 2/11 | 2/12 | 2/13 | 2/14 | 2/15 | 2/16 | 2/17 | 2/18 | 2/19 | 2/20 | 2/21 | 2/22 | 2/23 | 2/24 | 2/25 | 2/26 | 2/27 | 2/28 | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 14 | 0 | 142 | 87 | 0 | 130 | 81 | 0 | 83 | 111 | 0 | 22 | 79 | 2 | 772 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 6 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 14 | 0 | 142 | 87 | 0 | 130 | 83 | 0 | 83 | 113 | 0 | 24 | 79 | 2 | 778 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 1.4 | 0.0 | 14.2 | 8.7 | 0.0 | 13.0 | 8.1 | 0.0 | 8.3 | 11.1 | 0.0 | 2.2 | 7.9 | 0.2 | 77.2 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 3.5 | 3.5 | 17.7 | 26.4 | 26.4 | 39.4 | 47.5 | 47.5 | 55.8 | 66.9 | 66.9 | 69.1 | 77.0 | 77.2 | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 11 | 0 | 121 | 129 | 0 | 115 | 111 | 0 | 100 | 73 | 0 | 11 | 55 | 46 | 799 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 12 | 0 | 123 | 129 | 0 | 115 | 112 | 0 | 100 | 73 | 0 | 12 | 55 | 46 | 804 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 1.1 | 0.0 | 12.1 | 12.9 | 0.0 | 11.5 | 11.1 | 0.0 | 10.0 | 7.3 | 0.0 | 1.1 | 5.5 | 4.6 | 79.9 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 3.8 | 3.8 | 15.9 | 28.8 | 28.8 | 40.3 | 51.4 | 51.4 | 61.4 | 68.7 | 68.7 | 69.8 | 75.3 | 79.9 | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 11 | 0 | 112 | 131 | 0 | 61 | 127 | 0 | 37 | 100 | 0 | 3 | 92 | 14 | 701 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 6 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 11 | 0 | 112 | 131 | 0 | 61 | 129 | 0 | 38 | 103 | 0 | 3 | 92 | 14 | 707 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 1.1 | 0.0 | 11.2 | 13.1 | 0.0 | 6.1 | 12.7 | 0.0 | 3.7 | 10.0 | 0.0 | 0.3 | 9.2 | 1.4 | 70.1 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 2.4 | 2.4 | 13.6 | 26.7 | 26.7 | 32.8 | 45.5 | 45.5 | 49.2 | 59.2 | 59.2 | 59.5 | 68.7 | 70.1 | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 3 | 0 | 127 | 37 | 0 | 144 | 64 | 0 | 166 | 23 | 34 | 42 | 60 | 33 | 754 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 4 |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 3 | 0 | 128 | 37 | 0 | 144 | 64 | 0 | 167 | 23 | 34 | 43 | 60 | 33 | 758 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 0.3 | 0.0 | 12.7 | 3.7 | 0.0 | 14.4 | 6.4 | 0.0 | 16.6 | 2.3 | 3.4 | 4.2 | 6.0 | 3.3 | 75.4 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 2.4 | 2.4 | 15.1 | 18.8 | 18.8 | 33.2 | 39.6 | 39.6 | 56.2 | 58.5 | 61.9 | 66.1 | 72.1 | 75.4 | |

Supplement 1-3. Result of previous reproduction test

(Nominal concentration : 3.75 mg/L)

| | | (Nominal concentration : 3.75 mg/L) | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---------------------------|---------------------------------------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Rep. No | Counts | | Time | | | | | | | | | | | | | | | | | | | | | Total |
| | | | 2/8 | 2/9 | 2/10 | 2/11 | 2/12 | 2/13 | 2/14 | 2/15 | 2/16 | 2/17 | 2/18 | 2/19 | 2/20 | 2/21 | 2/22 | 2/23 | 2/24 | 2/25 | 2/26 | 2/27 | 2/28 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 12 | 0 | 132 | 62 | 0 | 106 | 85 | 0 | 81 | 91 | 0 | 3 | 101 | 705 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 2 | 5 | 0 | 0 | 1 | 13 | |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 12 | 0 | 134 | 63 | 0 | 106 | 86 | 0 | 83 | 96 | 0 | 3 | 102 | 718 | |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 1.2 | 0.0 | 13.2 | 6.2 | 0.0 | 10.6 | 8.5 | 0.0 | 8.1 | 9.1 | 0.0 | 0.3 | 10.1 | 70.5 | |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 4.4 | 4.4 | 17.6 | 23.8 | 23.8 | 34.4 | 42.9 | 42.9 | 51.0 | 60.1 | 60.1 | 60.4 | 70.5 | | | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 8 | 0 | 133 | 24 | 1 | 122 | 58 | 2 | 70 | 67 | 18 | 0 | 81 | 618 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 1 | 0 | 1 | 10 | |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 8 | 0 | 133 | 24 | 1 | 122 | 60 | 2 | 70 | 72 | 19 | 0 | 82 | 628 | |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 0.8 | 0.0 | 13.3 | 2.4 | 0.1 | 12.2 | 5.8 | 0.2 | 7.0 | 6.7 | 1.8 | 0.0 | 8.1 | 61.8 | |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 3.1 | 3.1 | 16.4 | 18.8 | 18.9 | 31.1 | 36.9 | 37.1 | 44.1 | 50.8 | 52.6 | 52.6 | 60.7 | | | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 3 | 0 | 161 | 13 | 0 | 137 | 57 | 0 | 97 | 50 | 0 | 0 | 58 | 616 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 7 | |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 3 | 0 | 163 | 13 | 0 | 137 | 57 | 0 | 98 | 52 | 0 | 0 | 60 | 623 | |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 0.3 | 0.0 | 16.1 | 1.3 | 0.0 | 13.7 | 5.7 | 0.0 | 9.7 | 5.0 | 0.0 | 0.0 | 5.8 | 61.6 | |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 4.3 | 4.3 | 20.4 | 21.7 | 21.7 | 35.4 | 41.1 | 41.1 | 50.8 | 55.8 | 55.8 | 55.8 | 61.6 | | | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 20 | 0 | 72 | 108 | 0 | 42 | 138 | 0 | 44 | 146 | 0 | 2 | 75 | 704 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 5 | 0 | 2 | 0 | 12 | |
| | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 20 | 0 | 72 | 110 | 0 | 42 | 139 | 0 | 46 | 151 | 0 | 4 | 75 | 716 | |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 2.0 | 0.0 | 7.2 | 10.8 | 0.0 | 4.2 | 13.8 | 0.0 | 4.4 | 14.6 | 0.0 | 0.2 | 7.5 | 70.4 | |
| Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 2.5 | 2.5 | 9.7 | 20.5 | 20.5 | 24.7 | 38.5 | 38.5 | 42.9 | 57.5 | 57.5 | 57.7 | 65.2 | | | |

Supplement 1-4. Result of previous reproduction test

(Nominal concentration : 7.50 mg/L)

| Rep. No | Counts | Time | | | | | | | | | | | | | | | | | | | | | Total |
|------------|---------------------------|-------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| | | 2/8 | 2/9 | 2/10 | 2/11 | 2/12 | 2/13 | 2/14 | 2/15 | 2/16 | 2/17 | 2/18 | 2/19 | 2/20 | 2/21 | 2/22 | 2/23 | 2/24 | 2/25 | 2/26 | 2/27 | 2/28 | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 23 | 0 | 0 | 0 | 1 | 0 | 2 | 13 | 0 | 0 | 6 | 7 | 55 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 6 |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 25 | 0 | 0 | 0 | 1 | 0 | 2 | 14 | 0 | 2 | 6 | 8 | 61 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 2.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 1.3 | 0.0 | 0.0 | 0.6 | 0.7 | 5.5 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 2.6 | 2.6 | 2.6 | 2.6 | 2.7 | 2.7 | 2.9 | 4.2 | 4.2 | 4.2 | 4.8 | 5.5 | |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 20 | 0 | 0 | 10 | 0 | 7 | 20 | 13 | 0 | 59 | 8 | 151 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 3 | 0 | 0 | 1 | 3 | 0 | 3 | 0 | 16 |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 22 | 0 | 2 | 13 | 0 | 7 | 21 | 16 | 0 | 62 | 8 | 167 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 2.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.7 | 2.0 | 1.3 | 0.0 | 5.9 | 0.8 | 15.1 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 3.4 | 3.4 | 3.4 | 4.4 | 4.4 | 5.1 | 7.1 | 8.4 | 8.4 | 14.3 | 15.1 | |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 30 | 0 | 2 | 16 | 0 | 3 | 37 | 7 | 0 | 18 | 44 | 181 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 1 | 8 | 0 | 0 | 2 | 2 | 18 |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 31 | 0 | 2 | 20 | 0 | 4 | 45 | 7 | 0 | 20 | 46 | 199 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.4 | 3.0 | 0.0 | 0.2 | 1.6 | 0.0 | 0.3 | 3.7 | 0.7 | 0.0 | 1.8 | 4.4 | 18.1 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.4 | 5.4 | 5.4 | 5.6 | 7.2 | 7.2 | 7.5 | 11.2 | 11.9 | 11.9 | 13.7 | 18.1 | |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | F ₁ generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 17 | 0 | 0 | 21 | 0 | 4 | 7 | 8 | 0 | 13 | 6 | 82 |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 9 |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 19 | 0 | 2 | 22 | 0 | 4 | 8 | 10 | 0 | 13 | 6 | 91 |
| | Reproductivity/P | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 1.7 | 0.0 | 0.0 | 2.1 | 0.0 | 0.4 | 0.7 | 0.8 | 0.0 | 1.3 | 0.6 | 8.2 |
| | Cumulative reproductivity | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 2.3 | 2.3 | 2.3 | 4.4 | 4.4 | 4.8 | 5.5 | 6.3 | 6.3 | 7.6 | 8.2 | |

Supplement 1-5. Result of previous reproduction test

(Nominal concentration : 15.0 mg/L)

| | | (Nominal concentration : 15.0 mg/L) | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---------------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|
| Rep. No | Counts | | Time | | | | | | | | | | | | | | | | | | | | | Total | |
| | | | 2/8 | 2/9 | 2/10 | 2/11 | 2/12 | 2/13 | 2/14 | 2/15 | 2/16 | 2/17 | 2/18 | 2/19 | 2/20 | 2/21 | 2/22 | 2/23 | 2/24 | 2/25 | 2/26 | 2/27 | 2/28 | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | |
| 1 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F _I generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| | | Reproductivity/P Cumulative reproductivity | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.2 0.2 | 0.7 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.0 0.9 | 0.9 |
| 2 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | F _I generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| | | Reproductivity/P Cumulative reproductivity | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.1 0.1 | 1.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 0.0 1.1 | 1.1 |
| 3 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| | F _I generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| | | Reproductivity/P Cumulative reproductivity | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 1.3 1.3 | 1.3 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 0.0 2.6 | 2.6 |
| 4 | P generation | Live | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | | Dead | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - | |
| | F _I generation | Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | |
| | | Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| | | Reproductivity/P Cumulative reproductivity | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 0.0 0.0 | 1.6 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 0.0 1.6 | 1.6 |

Supplement 1-6. Result of previous reproduction test

(Nominal concentration : 30 mg/L)

[illegible]