4-30-2009

RCMS MI TEAM Macro-Invertebrate Stream Monitoring

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Conclusion
What can we learn about stream health using Macro-invertebrate identification?

Macro-invertebrates have tolerance levels that range from 1-10. If organisms' tolerance levels are 3 or less, then they have a low tolerance for a polluted environment.

If organisms have tolerance levels 7 or greater, they can live in a polluted environment. Large numbers of high tolerance organisms, or the lack of low tolerance organisms may indicate a polluted stream.

Tolerance levels are used to calculate the macro-invertebrate group index.
We collected and sorted samples from the Norroway Stream.

- Rifle Beetle
- Caddisfly
- Hellgrammite
- Mayfly
- Gilled Snail
- Stonefly Larva
- Water Penny
- Blackfly Larva
- Planarian
Next, we counted and calculated the biotic index using tolerance levels. Our MGBI was 6.19.

<table>
<thead>
<tr>
<th>Major Group</th>
<th>Common Name</th>
<th>Count 1</th>
<th>Count 2</th>
<th>Average Gr. Count</th>
<th>Average Org. Density</th>
<th>Group %</th>
<th>Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ephemeroptera</td>
<td>Mayfly</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>24</td>
<td>4.17%</td>
<td>2</td>
</tr>
<tr>
<td>Plecoptera</td>
<td>Stonefly</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>1</td>
</tr>
<tr>
<td>Trichoptera</td>
<td>Caddesfly</td>
<td>9</td>
<td>0</td>
<td>5</td>
<td>60</td>
<td>10.42%</td>
<td>3</td>
</tr>
<tr>
<td>Diptera:Chromomidae</td>
<td></td>
<td>29</td>
<td>19</td>
<td>24</td>
<td>288</td>
<td>50.00%</td>
<td>7</td>
</tr>
<tr>
<td>Diptera: other</td>
<td></td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>48</td>
<td>8.33%</td>
<td>4</td>
</tr>
<tr>
<td>Odonata</td>
<td>Dragonfly</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>12</td>
<td>2.08%</td>
<td>5</td>
</tr>
<tr>
<td>Megaloptera</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>2</td>
</tr>
<tr>
<td>Coleoptera</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>4</td>
</tr>
<tr>
<td>Hemiptera</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>8</td>
</tr>
<tr>
<td>Amphipoda</td>
<td>Scuds</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>2.08%</td>
<td>7</td>
</tr>
<tr>
<td>Isopoda</td>
<td>Sow Bugs</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>36</td>
<td>6.25%</td>
<td>8</td>
</tr>
<tr>
<td>Decapoda</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>6</td>
</tr>
<tr>
<td>Gastropoda</td>
<td>Snails</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>24</td>
<td>4.17%</td>
<td>7</td>
</tr>
<tr>
<td>Nematoda</td>
<td>worms</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>12</td>
<td>2.08%</td>
<td>0</td>
</tr>
<tr>
<td>Pelecypoda</td>
<td></td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>12</td>
<td>2.08%</td>
<td>7</td>
</tr>
<tr>
<td>Oligochaeta</td>
<td>worms</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>36</td>
<td>6.25%</td>
<td>9</td>
</tr>
<tr>
<td>hirudinea</td>
<td>leeches</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>12</td>
<td>2.08%</td>
<td>10</td>
</tr>
<tr>
<td>Turbellaria</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>2.08%</td>
<td>4</td>
</tr>
</tbody>
</table>

**MGBI**: 6.1875

<table>
<thead>
<tr>
<th>Major Group</th>
<th>Percentage of Top % Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diptera</td>
<td>58.3</td>
</tr>
<tr>
<td>Trichoptera</td>
<td>10.42</td>
</tr>
<tr>
<td>Isopoda</td>
<td>6.25</td>
</tr>
<tr>
<td>Oligochaeta</td>
<td>6.25</td>
</tr>
<tr>
<td>Ephemeroptera</td>
<td>4.17</td>
</tr>
<tr>
<td>Gastropoda</td>
<td>4.17</td>
</tr>
</tbody>
</table>
Invertebrate Groups by Top 5 Percentages

Diptera had the highest count at 64%

- Diptera: 64%
- Gastropoda: 5%
- Ephemoroptera: 7%
- Oligochaeta: 7%
- Isopoda: 12%
- Trichoptera: 5%
Diptera:

- We found two main types (Chironomidae and Simuliidae) but our sample was over 50% Chironomidae.
- Total percentage was 64%
- Tolerance level for Chironomidae is 7. This means it can tolerate contaminated streams
Trichoptera:

- My organism is Trichoptera. It is also called caddis fly. The tolerance level is 3. It means it can’t stand pollution.
- Trichoptera is a case builder. We found lots of mineral cases.
- Our sample was 12%
Isopoda:

- Sow bugs were present in our sample at 7%
- They have a tolerance level of 8
- They are often found in dark nooks and crannies
- They eat decaying animals, vegetation and fungi
- They can tolerate polluted streams
Gastropoda (Snails)

Our sample contained 7% snails
Snails have a tolerance of 7
They have a high tolerance.

Something smells fishy
Oligochaeta: Worm

- Present at 7%
- Has a tolerance level of 9
- Can live in a polluted environment
Ephemeroptera (Mayfly)

Made up 5% of our sample
Has a tolerance of 2
Very low counts may mean that the organism can not tolerate the aquatic Environment due to pollution.
Our analysis of Grove St. Creek

- According to our calculations the MGBI of our stream is 6.19.
- According to our references a reading of 6.19 would indicate a moderately polluted (impaired) creek. A non-impaired creek would have a range of 0-3.75.
- Also we had a very small number of low tolerance organisms which may mean that our stream is polluted.
- We would need a larger sample of Macro-invertebrates before we could be certain.
Thank you.

- RCMS MI-Team
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- Zhana Davis  Soumaya Wahbi
- Alexandria Ellison  Mrs. Ohimor
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- Denzell Huggins
- Dayshawna Harris