

The trials and tribulations of working with *Americamysis bahia*: A mysid success story.

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INTRODUCTION

The mysid shrimp, *Americamysis bahia* has a reputation of being a difficult species to work with; they are cannibalistic, easily stressed, can have variable fecundity and cultures can unexpectedly crash. Mysid shrimp studies are used in regulatory ecotoxicology in both the USA and Europe. In Europe, if a plant protection product (PPP) has an insecticidal mode of action (MOA) then the acute toxicity of an additional arthropod is required. This obligation can be satisfied by *A. bahia*, as well as any subsequent chronic testing if required. We decided to investigate the feasibility of mysid shrimp testing at our laboratory and after numerous initial challenges over the past two and a half years we have started to reap the rewards of our hard work and determination.



Figure 1. *Americamysis bahia*

MYSID CULTURING

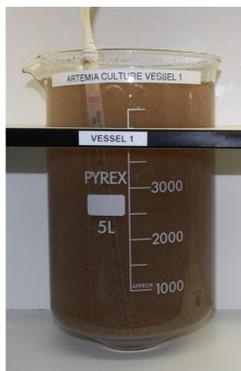


Figure 2. *Artemia salina* culturing for Mysid food

Setting up a healthy and fecund laboratory mysid population was our first hurdle. We imported the mysids *Americamysis bahia* from an establish and reputable supplier in the United States. The population was healthy and sustained itself, however we struggled to consistently produce a large number of offspring for studies when we first began. After approximately 6 months of trial and error we can now consistently produce an excess of 3000 offspring per day. Food and environment were the main factors in our successes.

STUDIES CONDUCTED

Case study 1: A 96 hour Mysid flow through study using acetone as a solvent to replicate a historic study from the 1980s. Acetone is not the solvent of choice as it causes microbial growth (Fig 3) and in this case the microbial growth caused toxicity, causing 100% mortality in all treatments and solvent control after 48 hours. To overcome the problem we finely filtered the water, changed filters regularly, cleaned the rig daily and reduced light levels. These alterations were successful and the study passed all validity criteria with 98% survival in the controls.

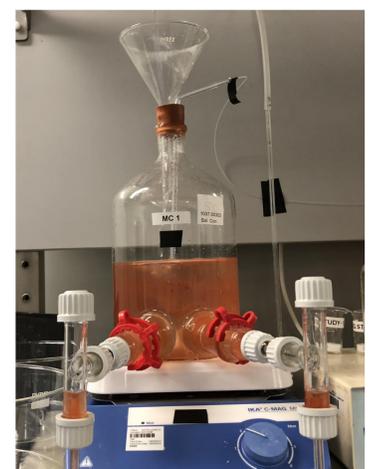


Figure 3. Microbial growth observed in the solvent control



Figure 4. Mysid chronic flow through test set up

Case study 2: A 28 day Mysid flow through study (Fig 4). Again acetone was used as the solvent so conditions of exposure were adapted to ensure microbial growth did not impact the validity of the study. There was 8 & 10% mortality in the control and solvent control respectively, well within the validity criteria. The mean offspring / female was 30.3 and 28.1 for the control and solvent control respectively (Fig 5).

Case study 3: A 28 day Mysid flow through study. The test substance was maintained between 93 – 99% of nominal test concentrations over the duration of the study. There was 7 & 10% mortality in the control and solvent control respectively, well within the validity criteria. The mean offspring / female was 21.7 and 20.4 for the control and solvent control respectively, with 100% of control offspring producing >3 offspring.



Figure 5. Observations taken during the chronic study