# ACID MINE DRAINAGE AND COAL COMBUSTION PRODUCTS AFFECT *CORBICULA FLUMINEA* AND *GAMBUSIA AFFINIS*[I]

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**Abstract:** Toxicity tests and exposure experiments define the impacts of different metals on terrestrial and aquatic organisms. However, few examinations have evaluated the impacts of combined metals, similar to acid mine drainage (AMD), on fish and invertebrates. Toxicity associated with some selenium rich coal combustion products (CCP) has been identified, but little work has been done to identify toxicity associated with low sulfur, high alkalinity fluidized bed ash (FBA). Because FBA has been used to remediate AMD it is important to identify any potentially negative impacts from FBA to aquatic organisms. In this study, *Corbicula fluminea* and *Gambusia affinis* were exposed to synthetic AMD and an FBA extract in a controlled laboratory environment to complement *in situ* exposures at a current FBA injected AMD treatment site. Exposure periods were intermediate lasting 21 days. Synthetic mine drainage was created to mimic pre and post-injection metal concentrations and *C. fluminea* and *G. affinis* were exposed to different treatments. Test organisms were also exposed to a diluted concentration of FBA extract. Mantel, foot, and visceral mass tissues were harvested from *C. fluminea* and whole fish samples were prepared from *G. affinis* for metal content analysis. Organismal responses, such as condition factor and condition index, did vary among organisms exposed within different experimental treatments. Significantly greater condition index values were observed with *C. fluminea* exposed to post-FBA injected synthetic mine drainage. Trends of metal tissue accumulation, compared to water concentrations, were observed for a limited number of metals. Although FBA injections have proven to have positive impacts on water quality, biological examinations are necessary to holistically evaluate impacts to the environment.

Additional Key Words: synthetic acid mine drainage, fluidized bed ash extract, controlled metal exposure.

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